SAMOAN MATERIAL CULTURE

BY

TE RANGI HIROA

(P. H. BUCK)

BERNICE P. BISHOP MUSEUM

BULLETIN 75

HONOLULU, HAWAII

PUBLISHED BY THE MUSEUM

1930

SAMOAN MATERIAL CULTURE

BY

TE RANGI HIROA

(P. H. BUCK)

BERNICE P. BISHOP MUSEUM
BULLETIN 75

HONOLULU, HAWAII
PUBLISHED BY THE MUSEUM
1930

CONTENTS

	Page
Introduction	3
Houses	8
General features	8
Terminology	10
Types of houses	11
Carpenter shed	11
Canoe shed	11
Cooking houses	13
Types and methods of construction	13
Dwelling houses	16
Guest houses	19
The long guest house	20
The round guest house	22
Preparation	22
Itu middle section	27
Tala rounded end sections	45
The roof	60
House platforms	66
Names of houses	69
Spirit houses or temples	70
Store houses	70
House furnishings	71
Mat collecting	75
Protection of houses	82
Guild of builders	84
Society trade marks	86
Contracts	86
Feasts	90
Ceremony of raising posts	91
The final feast	96
Ceremonial positions	96
Cooking utensils, food, and kava	98
The kitchen	98
Fire	98
Firewood	99
The earth oven	100
Tongs	101
Leaf covers	102
Processes in food preparation	103
Vessels and bowls	104
Food utensils	108
Foods	119
Varieties and use	119
Flesh foods	119
Vegetable foods	127
Resume of cooking processes	136
Meals	137
Serving	139
Food customs	140
Kava	147
Utensils	147
Kava bowls	148
Kava drinking cups	150
The strainer	151
Stone anvils and beaters	152
Preparation of the beverage	153
Serving	154
Kava cup titles	158
Kava naming ceremony	159
The usual ceremony	160
Status of kava	163

Page

Plaiting ... 164
Terminology ... 165
Material ... 168
House accessories ... 169
Coconut leaf food platters ... 182
Baskets ... 189
Common types ... 189
Fishing baskets ... 195
Chief's basket ... 200
Round baskets ... 202
Breadfruit cover ... 204
Miscellaneous baskets ... 205
Pandanus leaf baskets ... 205
Baskets for storing ... 206
Four-cornered baskets with round rims ... 207
Baskets made of sennit ... 207
Baskets in coiled work ... 208
Mats ... 209
Coconut-leaf mats ... 209
Pandanus mats ... 211
Papa or paongo mats ... 214
Fala mats ... 216
Right-angled plaiting ... 225
Lau'ie sleeping mats ... 226
Decoration in Samoan plaiting ... 227
Twines, cords, and ropes ... 231
Material ... 231
Terminology ... 232
Threads or fine cords ... 233
Twisted cords ... 233
Sennit two-ply cords ... 233
Three-ply twisted cords ... 234
Sennit three-ply braid ... 235
Four-ply round sennit ... 244
Four-ply braid ... 244
Five-ply braid ... 244
Ropes ... 245
Plaiting customs ... 247
Clothing ... 249
Kilts ... 249
Plaited kilts ... 257
Textile kilts ... 259
Shaggy garments ... 266
Transitional garments ... 274
Fine mats ... 275
Materials and implements ... 275
Bark cloth ... 282
Materials and technique ... 283
Bundling process ... 287
Beating the bast ... 287
Stretching ... 291
Drying ... 292
Closing the holes ... 292
The completion of siapo cloth ... 294
Plain siapo ... 294
Dyes ... 297
Varieties and methods of preparation ... 297
Colored designs on bark cloth ... 304
Samoan method of dyeing cloth ... 306
Varieties of rubbed cloth ... 312
Uses of bark cloth ... 312
Smoked cloth ... 313

	Page
Sandals	313
Significance of clothing, customs, and usages	316
Famous mats	319
Stonework	321
Unworked stone	321
Walls	322
Stone roads	323
Stone house	324
The seat of Sina	328
Ruins in Vaivasa Valley	328
Propitiatory rocks	329
Tupua rocks	329
Worked stone	330
Adzes	332
Terminology	333
Quadrangular adzes	334
Triangular adzes	347
Summary of types and technique	354
Adz hafting	356
Miscellaneous stone tools	364
Chisels	364
Gouges	367
Stone coconut graters	367
Knives and scrapers	368
Sinkers	369
Anchors	369
Squid lure sinkers	369
Throwing discs and other artifacts	369
Summary	370
Canoes	370
Dugout canoes	371
Plank canoes	371
The small dugout canoe	372
The medium dugout canoe	378
The large dugout canoe	378
Plank canoes	380
The bonito plank canoe	380
The three-boom plank canoe	404
The boat canoe	405
The double canoe	407
Customs and usage	414
History	417
Fishing	418
General features	418
Snares	420
Shark noose and its uses	422
Floats	427
Torches	428
Coconut leaf sweeps	429
Leaf weirs and dams	432
Lures	434
Fish spears	438
Bow and arrow	439
Scoops	439
Fish narcotizing	443
Walled fish weirs	444
Fish traps	446
Manipulated trap	447
Self-acting traps	449
The lobster pot trap	450
The separate funnel trap	454
The double entrance trap	458

	Page
Bamboo double entrance trap	463
Sea eel trap	466
Nets	469
Netting material	470
Technique	470
Types of nets	474
Hand nets	474
Casting net	480
Seine nets	482
Angling	489
Cobwebs and gorges	489
Hooks	490
Baited hooks	490
Trolling hooks	494
The large trolling hook	497
Bonito trolling hook	497
Hand line trolling hooks	510
Hand rod trolling hooks	514
Usage and custom	517
Snakes	523
Hunting	524
Traps	524
Nets	526
Hooking appliance	526
Fowling	526
Snares	527
Traps	527
Bow and arrow	530
Pigeon netting	532
Tern netting	5[illegible]1
Food, sport, and social influence	541
Horticulture	544
Implements	545
Cultivable food plants	546
Textile plants	549
Fruit plants	549
Scarecrows	551
Prohibitions and myths	551
Remarks	551
Games and recreations	552
Toys	552
Swings and skipping ropes	552
Stilts	552
Sliding	552
Tops	553
Jackstones	553
Water tip-cat	555
Kites and flying leaves	555
Pigeon flying	556
String figures	557
Jackstraws	563
Disc pitching	563
Disc throwing	565
Dart throwing	566
Spear throwing	570
Club matches	572
Summary	573
Musical instruments	574
Dance time implements	574
The wooden gongs	575
The drum	578
Trumpets	578
Sound instruments	580

Page
Dance accessories 581
Summary 581
Weapons 583
Clubs 583
Billet clubs 588
Rootstock clubs 588
Mace clubs 589
Coconut stalk clubs 589
The eight-spiked club 592
The bilateral-toothed club 594
Paddle clubs 596
The ear-shaped, or mushroom club 601
The unilateral-toothed and hook clubs 603
Doubtful clubs 606
Short clubs 606
Spears 606
Slings 608
War accessories 609
Carving 609
Summary 611
Religious objects 613
Personal adornment and decoration 615
Headdresses 615
Hair ornamentation 619
Combs 622
Ear ornaments 627
Necklaces 628
Breast ornaments 630
Armlets and anklets 630
Body decoration 630
Staffs 631
Fly whisks 631
Fans 633
Summary 634
Tattooing 635
Implements 636
Tattooing motifs 641
The operation 642
Variation in design elements 654
Remarks 655
Women's tattooing 656
Tattooing motifs 656
The operation 658
Traditional origin 658
Customs 660
Conclusion 661
Literature cited 681
Explanation of plates 683
Index 699

ILLUSTRATIONS

Plates I to LV Following page 697
Map showing Samoan group To face page 3
Figure 1. Carpenter shed 11
2. Canoe shed 12
3. Cooking house, rectangular section 13
4. Cooking house, ground plan 14
5. Cooking house, rectangular section (utupoto type) 14

Page

6. Cooking house, rounded end 15
7. Dwelling house, middle section 17
8. Dwelling house, rounded end section 17
9. Long guest house 20
10. Round house, ground plan 24
11. Scaffolding 24
12. Lashing of the scaffolding 25
13. Types of supporting posts 27
14. Lashing of ridge pole to main post 28
15. Rafters, upper ends 30
16. Fitting upper ends of rafters 30
17. Lashing rafters to ridge pole 30
18. Rafters, position and temporary lashings 32
19. Rafters, permanent curve and adjustment 33
20. Lashing purlins to principal rafters 34
21. Thatch rafter join 35
22. Lashing of thatch rafter join 36
23. Lashing of thatch rafter to purlins 37
24. Completed lashing, thatch rafters and purlins 37
25. Lashing intermediate purlins to rafters 38
26. Eave batten join 39
27. Lashing eave batten to thatch rafters 40
28. Lashing collar beam to main purlin 41
29. Lashing collar beam to main post 42
30. Completed lashing, collar beam to main post 43
31. Lashing two collar beams to middle main post 43
32. Cross section of completed framework, middle section, round house 44
33. Right-angled and slant joins 45
34. Joins of arched purlins 46
35. Assembling upper series of arches 47
36. Assembling lower series of arches 48
37. Scaffolding, round end section 49
38. Erecting the curb plate 49
39. Ridge pole end piece 50
40. Ridge pole end piece, second type 50
41. Erection of arched purlins 51
42. Thatch rafters of end section 53
43. Lashing of thatch rafters 54
44. Unorthodox arrangement of arches 53
45. Constructional position of arched joints 55
46. Types of wall posts 57
47. Lashing of wall posts 58
48. Lashing of wall posts 58
49. Wall post lashings 59
50. Wall post lashings 59
51. Pinning thatch sheets 61
52. Thatching needle points 62
53. Half-hitch thatching method 62
54. Overhand knot thatching method 63
55. Shelf and hanger (talitali) 71
56. Collar beam shelves 72
57. Fata shelf 72
58. Water bottle shelf 72
59. Wall screen attachments 73
60. Pillow legs lashing 77
61. Pillow legs lashing 78
62. Food protection against rats 80
63. Trade mark of Le Malama guild 87
64. End section, showing change of builder 90
65. Positions at fa'atunga feast 91
66. Leaf oven cover 102
67. Types of bowls 107
68. Breadfruit pickers 116

		PAGE
69.	Breadfruit picker, net technique	117
70.	Breadfruit picker, net attachment	118
71.	Carrying poles	118
72.	Pig, ceremonial division	121
73.	Bonito, ceremonial division	124
74.	Shark, ceremonial division	125
75.	Check plaiting, working edge	166
76.	Plaiting section	167
77.	Roof sheet technique	170
78.	Roof sheet, pinning leaflets	171
79.	Roof sheet, right edge finish	171
80.	Roof sheet, technique of right half sheet	172
81.	Carrying sheet, plaiting of half sheet	172
82.	Carrying sheet, joining half sheets (first course)	173
83.	Carrying sheet, joining (second course)	175
84.	Ridging sheet	176
85.	Wall screen, commencement	177
86.	Wall screen, horizontal twill	178
87.	Wall screen, vertical twill	179
88.	Wall screen, geometrical pattern	180
89.	Wall screen, geometrical pattern	181
90.	Wall screen, finishing braid	182
91.	Plaited mailo food platter	183
92.	Temporary laulau food platter	184
93.	Permanent food platter, combining midrib strips	185
94.	Food platter, twill commencement	186
95.	Food platter, braid finish (first course)	187
96.	Food platter, braid finish (second course)	188
97.	Basket plait and join	190
98.	Basket, closing bottom (first course)	191
99.	Basket, closing bottom (second course)	192
100.	Basket, closing bottom (first course)	193
101.	Basket, closing bottom (second course)	194
102.	Basket commencement	196
103.	Basket commencement	197
104.	Basket commencement	197
105.	Basket, rim twist and join	199
106.	Basket, five-ply braid finish	200
107.	Round basket, bottom rim twist	203
108.	Breadfruit cover	204
109.	Pandanus leaf basket, commencement	206
110.	Coiled basket technique	208
111.	Coconut leaf mat	210
112.	Pandanus mat, double weft commencement	213
113.	Pandanus mat, first corner	214
114.	Pandanus mat, second corner	215
115.	Sleeping mat, double butt commencement	217
116.	Sleeping mat, left edge	218
117.	Sleeping mat, finishing edge	219
118.	Sleeping mat, types of end finish	220
119.	Sleeping mat, serrated edge technique	222
120.	Sleeping mat, serrated edge finish	223
121.	Baby mat, open slit ornamentation	224
122.	Baby mat, tapito commencement	226
123.	Geometrical motives in plaiting	229
124.	Eye shade technique	230
125.	Two-ply cord, joining ply	234
126.	Two-ply cord, alternate join	234
127.	Three-ply twisted cord, join	235
128.	Three-ply sennit braid, plait technique	238
129.	Three-ply sennit braid, join of ply	239
130.	Three-ply sennit braid, reinforcing thin ply	239
131.	Three-ply sennit braid, simple join	240

Page

132. Sennit coil technique 243
133. Four-ply round braid 244
134. Four-ply braid 245
135. Five-ply braid 245
136. Cordyline leaf kilt, braid commencement 250
137. Cordyline leaf kilt, double layer commencement 252
138. Bast kilt, single cord attachment 253
139. Bast kilt, two-cord attachment 254
140. Bast kilt, loop ornamentation 254
141. Bast kilt, braid technique 255
142. Pandanus kilt, double cord attachment 256
143. Feather kilt, feather attachment 257
144. Plaited kilt, check plait 257
145. Plaited kilt, twill technique 258
146. Textile garment, left corner commencement 260
147. Textile kilt, first working section 261
148. Textile kilt, fringe additions 263
149. Textile kilt, fringe and braided tails 264
150. Textile kilt, edge and braid tails 265
151. Textile kilt, arrangement of tags 266
152. Shaggy garment, commencement 267
153. Shaggy garment, technique 268
154. Shaggy garment, technique 269
155. Shaggy garment, working edge 270
156. Shaggy garment, tag attachment 271
157. Shaggy garment, tag attachment 271
158. Shaggy garment, finishing technique 272
159. Kilt, transitional type 275
160. Braiding lau'ie leaves 276
161. Fine mat, technique 278
162. Fine mat, finish 279
163. Fine mat, upper edge 280
164. Fine mat, finish 281
165. Fine mat, triangular ornamentation 282
166. Dye strainer, plait technique 298
167. Rubbing bark cloth on tablet 310
168. Bast sandal technique 314
169. Sandal of coconut lau'a'a 315
170. Sandal of coconut husk 315
171. Terminology of quadrangular adzes 334
172. Terminology of triangular adzes 335
173. Adz, type I 336
174. Adz, type I, thick variety 336
175. Adz, type I, long narrow 337
176. Adz, type I, long narrow 337
177. Adz, type I, short wide 338
178. Adz, type I, short wide 338
179. Adz, type II, subtype a 339
180. Adz, type II, subtype b 340
181. Adz, type II, subtype b 341
182. Adz, type II, subtype b 341
183. Adz, type I with ground sides 342
184. Adz, type I, well-ground 343
185. Adz, type III 343
186. Broken adz, type III 344
187. Adz, type IV, subtype a 344
188. Adz, type IV, tubtype a 345
189. Adz, type IV, subtype b 345
190. Adz, type IV, subtype b 346
191. Adz, type IV, intermediate 346
192. Adz, type V 347
193. Adz, type V 348
194. Adz, type V, variation 348

PAGE

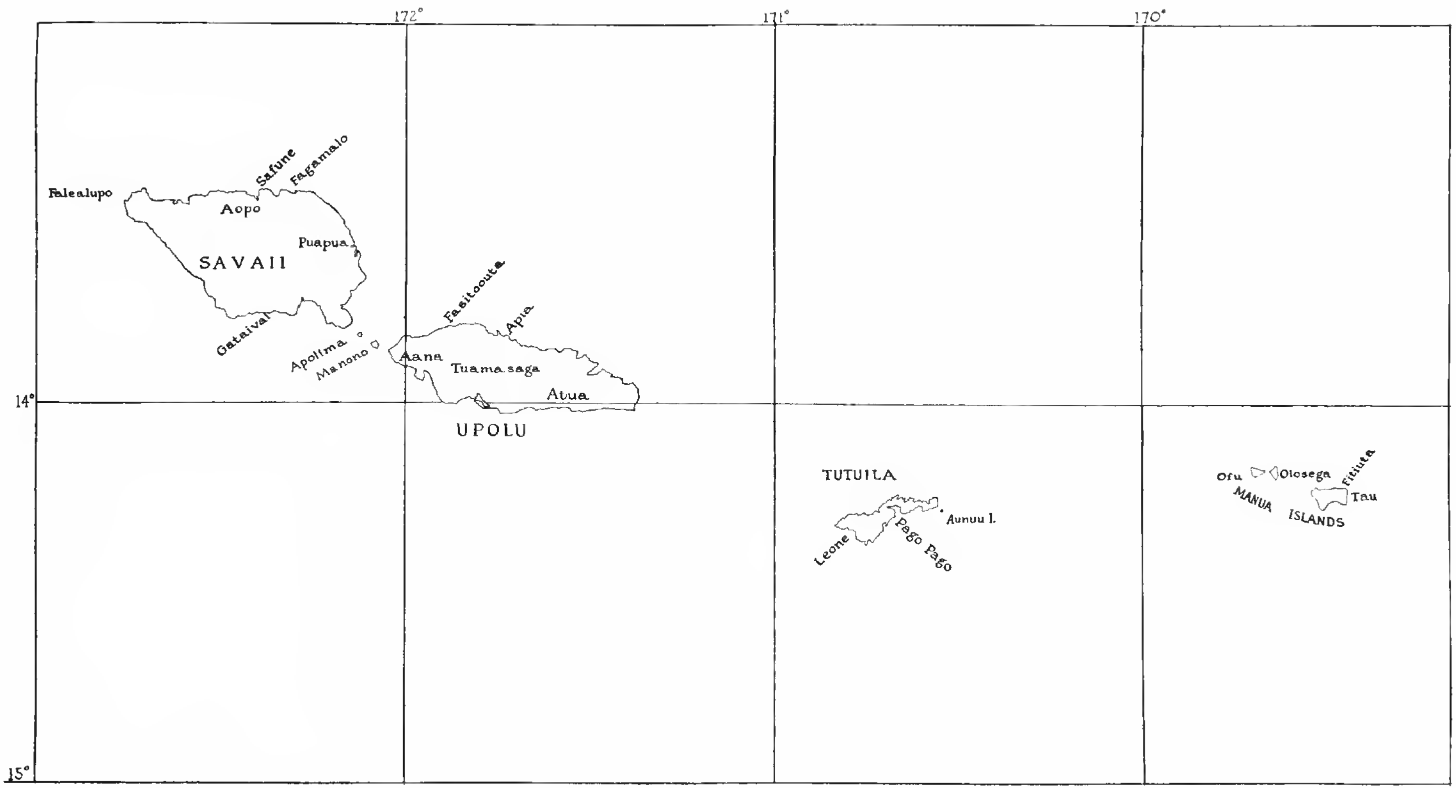
195. Triangular adz, type VI 349
196. Large triangular adz, type VI 350
197. Triangular adz, type VII 351
198. Triangular adz, type VII 352
199. Triangular adz, type VIII 352
200. Small adz, type I 353
201. Small adz, type III 353
202. Small adz, type IV 354
203. Cross sections of adz types 354
204. Cross sections, intermediate types of adzes 355
205. Adz haft types 357
206. Hafting technique of adz 359
207. Hafting technique 360
208. Hafting technique 361
209. Hafting technique 362
210. Hafting in handle axis 363
211. Short quadrangular chisel 364
212. Long quadrangular chisel 365
213. Long triangular chisel 365
214. Broken triangular chisel 366
215. Broken triangular chisel 366
216. Reversed triangular chisel 367
217. Stone coconut grater 368
218. Stone coconut grater from adz 368
219. Paopao canoe 373
220. Cross sections, log and canoe hull 374
221. Paopao canoe ornamentation 374
222. Soatau dugout canoe 378
223. Dugout 'iatolima canoe 379
224. Bonito canoe plank sections 381
225. Bonito canoe, simple keel 382
226. Bonito canoe, setting up keel 383
227. Bonito canoe, stern piece section 384
228. Bonito canoe, bow piece section 385
229. Bonito canoe, holes through flanges 386
230. Bonito canoe, flange lashing 387
231. Bonito canoe, temporary lashing 388
232. Bonito canoe plank section 388
233. Bonito canoe, keel lashing 389
234. Bonito canoe, lashing gunwale 390
235. Bonito canoe, bow cover 391
236. Bonito canoe, lashing cover 391
237. Bonito canoe, bow piece lashing 392
238. Bonito canoe, stern cover 393
239. Bonito canoe, outrigger and gunwale lashing 394
240. Bonito canoe, connecting peg lashing 396
241. Bonito canoe, suspensory attachment of float 398
242. Savaii, suspensory attachment 398
243. Bonito canoe, stern seat 399
244. Bonito canoe, fishing rod support 400
245. Bonito canoe, fishing rod support 401
246. Lashing of ornamental shells 402
247. Canoe patches and repairs 403
248. Amatasi plank canoe 405
249. Double canoe, cross booms and deck 408
250. Double canoe, deck house 409
251. Double canoe, mast stepping 410
252. Double canoe, sail 411
253. Fish snares 421
254. Shark rattles 424
255. Coconut leaf sweeps 431
256. Leaf weirs 433
257. Squid lure 435

PAGE

258. Whitebait scoop 442
259. Walled fish traps 445
260. Manipulated fish traps 448
261. Fish trap, fanga i'a 450
262. Fish trap, 'enu 456
263. Fish trap, fanga uli 458
264. Fanga uli trap, bottom end 460
265. Fanga uli trap, weft join 461
266. Fanga uli trap, end finish 462
267. Bamboo fish trap, commencement 463
268. Bamboo fish trap, funnel and exit 465
269. Sea eel trap, lashing 467
270. Sea eel trap, entrance tube 468
271. Sea eel trap, mechanism 468
272. Netting technique 471
273. Netting technique, additional meshes 472
274. Net float lashing 473
275. Medium dip net 475
276. Scoop net frames 476
277. Arched net with bait 478
278. Mullet hand net 479
279. Shrimp net, shell sinkers 480
280. Fish gorges 489
281. Eel hook 491
282. Drill 496
283. Bonito hook, shanks and points 498
284. Bonito hook, lashing point to shank 500
285. Bonito hook, tying the snood 501
286. Bonito hook, lashing position 502
287. Bonito hook, completed lashing 502
288. Fishing rod lashing 503
289. Bamboo rod lashing 504
290. Pa ala hook, shanks and points 511
291. Pa seuseu hooks 516
292. Rat trap 524
293. Pig trap 525
294. Fowl trap 528
295. Pigeon netting seat 535
296. Pigeon net, handle lashings 537
297. String figure, vae pato 558
298. String figure, unnamed 559
299. String figure, laulau 559
300. String figure, pili me'ime'i 559
301. String figure, ati 560
302. String figure, mongamonga 561
303. String figure, ipu 561
304. String figure, fale sa 562
305. Dart with throwing string 569
306. Clubs, proximal ends 585
307. Clubs, types of suspensory lugs 586
308. Coconut stalk clubs 591
309. Eight-spiked clubs 593
310. Types of club points 594
311. Bilateral-toothed clubs 595
312. Paddle clubs, types II and III 599
313. Paddle clubs, types III and IV 600
314. Ear-shaped clubs 602
315. Unilateral-toothed and hook clubs 604
316. Spears 608
317. Club carving motifs 610
318. Carving motifs attributed to Samoa 611
319. Tuinga headdress, hair tuft lashing 617
320. Tuinga headdress, lave frame 617

PAGE

321. Coconut leaflet comb ... 623
322. Comb, wrapped technique ... 624
323. Comb, binding technique ... 626
324. Comb, wrapped work ... 627
325. Whale tooth necklace, lashing ... 629
326. Fly whisk technique ... 632
327. Tattooing comb, shaping teeth ... 636
328. Tattooing comb, handle lashing ... 638
329. Men's tattooing motifs ... 642
330. Tattooing, back commencement ... 644
331. Tattooing, back design elements ... 646
332. Tattooing, back design ... 647
333. Tattooing design, side and front ... 648
334. Tattooing design, back of thigh ... 649
335. Tattooing design, front of thigh ... 651
336. Tattooing design, thigh and knee ... 653
337. Women's tattooing motifs ... 657
338. Women's tattooing designs ... 659


172°
171°
170°
14°
15°
Falealupo
Safune
Fagamalo
Aopo
Puapua
SAVAII
Gataivai
Apolima
Manono
Fasitoouta
Apia
Aana
Tuamasaga
Atua
UPOLU
TUTUILA
Aunuu I.
Leone
Pago Pago
Ofu
Olosega
Fitiuta
Tau
MANUA ISLANDS

Samoan Material Culture

By

Te Rangi Hiroa

(P. H. Buck)

INTRODUCTION

Samoa is a group of islands in the western Pacific lying 13.5° to 14°S. lat. and 168° to 173°W. long. Rose Island, the most eastern of the group, is of coral formation and uninhabited. The other islands are volcanic, well-wooded, mountainous, and for the most part surrounded by coral reefs.

Up to the year 1900, the affairs of the whole group were jointly administered by the three powers, Britain, America, and Germany. At that date Britain withdrew. The islands to the east of the 171st. longitude were given to the United States which delegated control to its Navy Department. The islands to the west were administered by Germany until 1914, when, owing to the state of war between Germany and Britain, New Zealand troops took possession on August 29, 1914. At the end of the war, Germany renounced all right and title to western Samoa. The principal allied and associated powers agreed that the territory be administered by Britain and in 1920, the Dominion of New Zealand was empowered to administer the mandated territory.

American Samoa consists of the large island of Tutuila and the Manuan group consisting of the three small islands of Ofu, Olosega, and Tau to the east of Tutuila. The naval station and seat of administration is at Pago Pago in Tutuila. Western Samoa consists of the two large islands of Upolu and Savaii with the two small islands of Apolima and Manono lying between them. The seat of administration is at Apia in Upolu. Savaii, about 48 miles in length by 25 miles in breadth, is the largest and most western island of the group. Upolu has the largest population and is the most important island politically. The small Manuan group is important in the traditional history of Samoa.

The Samoan population of western Samoa on January 1, 1926, was given as 36,308. The population of American Samoa by the census of 1922 was given as 8,194 without counting those of mixed blood. The native population of the whole group on this data is 44,502. Numerically this makes the Samoans the largest branch of the Polynesians next to the Maori of New Zealand. Though admixture has taken place, there is a very high percentage

of full-blooded Samoans. Government and popular writers have referred to the Samoans as being the purest branch of the Polynesians. Such statements are assertions not based on any scientific data and should be disregarded until an anthropometrical survey of all branches of the Polynesians has been completed. Measurements were made in Samoa by Mr. E. W. Gifford and Mr. W. C. McKern and the material worked up by Sullivan (37). The Polynesians are a mixed people and until they can be dealt with as a whole, it is futile to make statements as to which branch retains most of the physical characteristics of the original stock which broke into the Pacific.

The speech of the Samoans is a dialect of the Polynesian language. As the Polynesians had no written language, the early missionaries represented the sounds phonetically by English letters as was done throughout Polynesia, Hawaii, and New Zealand. The usual Polynesian consonants are present with the exception of *h* and *k*. The *h* sound of other Polynesian dialects is represented in some words by the sibilant *s* and in others by *f*. The *k* sound was dropped but its place in a word is represented by the glottal closure which causes a hardening of the following vowel or almost the sound of *h*. In the written language, the elision of the *k* sound is represented by an inverted comma placed above the position which the sound originally occupied in the word. For comparative philology, it is necessary that the glottal comma be shown in the right position. The interchangeable *l*, *r*, *v*, and *w* sounds take the form of *l* and *v*. The *ng* sound is present but was unfortunately represented by the compilers of the alphabet as *g*. This usage has become official and is a source of confusion to those not acquainted with it. The important naval station in Tutuila through being written as Pago Pago is usually pronounced by the travelling public as Pay-go Pay-go or Pag-go Pag-go instead of Pango Pango. Even at this late period, the erroneous *g* should be altered to *ng*. To facilitate comparison with other Polynesian dialects, the lead given by Handy (14, p. 4) in representing the *ng* sound by the letters *ng* will be followed in this work[1]. It was done originally with the dialects of New Zealand and the Cook Islands and has given complete satisfaction. The authoritative work on the Samoan dialect is still the "Grammar and Dictionary" compiled by George Pratt (23).

Recent changes have taken place in the spoken language in the substitution of *k* for *t* and a loose mutual interchange between the sounds *n* and *ng*. The re-introduction of *k* in place of *t* is extremely interesting as it evidently indicates a Polynesian tendency not confined to one dialect. A similar change has already completely occurred in the Hawaiian dialect in which it passed through two distinct phases. Thus, in the widespread Polynesian word *kumete* (wooden bowl) the first phase was the dropping of the *k* so that the

[1] The Polynesian words "malaga" and "aumaga" are accepted by the Bishop Museum as English words. However, the *n* sound is included in their spelling throughout this text.

word became *'umete*. In the second phase which occurred later, the *t* was changed to *k* and the word became *'umeke*. Thus the lost *k* came back into the dialect but in no word did it reoccupy its original position. In the process of resurrection, the *k* displaced the *t* sound completely out of the dialect. In Samoa, the first phase of dropping the *k* had been completed before the Bible was printed in Samoan and *kumete* had become *'umete*. The second phase of substituting the *k* for *t* is now taking place in everyday speech and a wooden bowl is now more often referred to as *'umeke* than as *'umete*. The talking chiefs make the change in official speeches and the retention of the *t* sound is regarded by the public as pedantic. It seems probable that the Samoan *t* like the Hawaiian *t* is doomed to extinction.

The interchange between *n* and *ng* has become so common that I had to constantly consult Pratt to find out which was the original sound used. Thus in spoken speech, it is more usual to hear *paono* instead of the correct *paongo*, and *tafangi* instead of the correct *tafani*.

The Samoan population lives in large well-organized villages. Except for the doing away with some of the highest ranks, corresponding to that of petty kings and provocative of war in grasping at power, the introduction of a foreign culture has made little fundamental difference to the basis of Samoan society. The hereditary titles of high chiefs and talking chiefs are still conferred and supported by the family groups entitled to them. These are not inherited by primogeniture on the male line but are conferred by the group majority and hence lead to much political intrigue. The village *fa'alupenga* (order of rank prestige) is still jealously observed. Ancient customs connected with the drinking of kava, the distribution of food, the giving of fine mats, and much social ceremonial are still living factors in the life of the people and give pleasure and satisfaction. The pleasure derived from the exercise of native institutions is perhaps the most important factor that has led to the persistence of Samoan customs and helped them to resist the disintegration that has taken place in other parts of Polynesia. The Samoans are thus more conservative than other branches of their race and their satisfaction with themselves and their own institutions makes them less inclined to accept the changes that foreign governments consider would be of benefit to them. Their viewpoint is bounded by their own immediate horizon. This attitude of the mass of the people is expressed in the reply of a talking chief to myself after I had sketched the migrations of the Polynesians from the mainland of Asia to the remote isles of the Pacific. "We thank you for your address," he said. "The rest of the Polynesians may have come from Asia, but the Samoans—No. The Samoans originated in Samoa." The Samoans are self-contained. Strictly speaking, they require little in the way of clothing or food from foreign sources. So long as life is filled and satisfied by local conditions, they cannot be blamed for thinking that they are fit to govern

themselves. When life ceases to get entire satisfaction from native institutions, the present self-satisfaction may cease to be a bar to the progress that the introduced culture considers desirable.

Persistence of custom has led to the retention of much native material culture in Samoa. Custom and ceremonial must find material expression to obtain adequate satisfaction. The ceremonial treatment of chieftainship with observance of the *fa'alupenga* order of precedence found public expression in the calling of the kava in a properly constituted guest house. The need for guest houses kept up the ancient guild of carpenters who, to maintain a close corporation, perpetuated the native form of architecture and technique. The guild of carpenters also kept alive the craft of building the plank bonito canoe. Connected with chiefly prestige was the continuation of the art of tattooing. The survival of the custom of giving fine mats and bark cloth at births, deaths, and marriages has created a continued need for these articles and thus perpetuated the crafts of fine plaiting and making bark cloth. The village hostess (taupou) and the chief's son (manaia) had to be appropriately garbed on ceremonial occasions and this need led to the continuation of the making of various forms of kilts, shaggy garments, and headdresses of human hair. Samoa as a result of the persistence of custom has retained a greater measure of its material culture than other branches of the Polynesians who were more adaptable and who, as a consequence of accepting more of the elements of an introduced culture, have forgotten their own.

On the invitation of the high chief Tuitele of Tutuila extended on a previous visit to Mr. A. F. Judd, President of the Board of Trustees of Bishop Museum, an expedition consisting of Mr. Judd, Mr. Bruce Cartwright, and the author visited the island of Tutuila in September, 1927. A tour (malanga) lasting three weeks was made of the villages of Tutuila including the small island of Aunuu and everywhere the expedition was treated with the ceremonial characteristic of olden times. The sincere thanks of Bishop Museum are due to Tuitele and the chiefs of the villages visited for their hospitality and hearty assistance. Special reference must be made to Fepuleai Ripley who acted as our talking chief and interpreter during the tour.

On the return of my colleagues, I spent two months in the Manuan group, visiting all three islands. The district governor Tufele and his taupou Faapuaa rendered valuable assistance.

In western Samoa, two months were spent in Savaii and a short period in Upolu. Mr. E. Stehlin Jr., who acted as guide and consulting interpreter in Savaii rendered invaluable service. Government officials and traders in the two Samoas gave freely of their assistance. Many made gifts to the Museum, but special thanks are due to Mr. Anunsen of Manase, Savaii, for a collection of stone adzes which supplied valuable study material for that important island. My warm thanks are due to the Samoan chiefs of Savaii

and Upolu who imparted freely of their knowledge and gave liberally of their hospitality.

My thanks are due to Dr. C. M. Cooke, Jr., Mr. K. P. Emory, and other members of The Bishop Museum staff for assistance and advice during the compilation of the material of this work.

Where information was obtained first-hand in the field, it has not been considered necessary to refer to similar statements of fact made by other writers as no question of priority is involved. Much assistance was obtained from the manuscript account (17) of Mr. Judd's first visit to Tutuila and Manua in 1926. He recorded many details that were not observed by me and I have acknowledged the quotations made as the manuscript was not the least valuable of the works consulted. I am also indebted to the notes made by my two colleagues Mr. Judd and Mr. Cartwright of the 1927 expedition, as well as the kindly assistance and hearty cooperation which they extended to me throughout our investigations in Tutuila.

During the six months spent in Samoa, investigation was concentrated on material culture with such customs as shed light on the degree of importance played by the various complexes in the life of the people. Owing to the active continuance of many of the crafts, it was possible to record a good deal of technique in detail. The technique may be useful to the Samoans in days to come when the broadening of their horizon will inevitably lead to the decay of their native arts and crafts. From an ethnological point of view, details of technique are necessary to form exact comparisons in material culture. The question of diffusion has been confused by comparing end products which have been arrived at by different technical processes. Unless the technical details are similar, the end products cannot well be regarded as identical. Technique may be drudgery to the student but it has a romance of its own. It indicates how different groups of people have sought to supply their material needs by adapting an old method to local material, by evolving improvements, or by inventing a new technique. Throughout each technical process difficulties occurred that had to be surmounted and human thought is expressed by the manner in which skilful fingers sought to achieve the desired end. The end product may or may not be a masterly result but the details of technique reveal the stages of evolution through which the craft has passed. Technique reveals stasis or advance. When available, it must form one of the most valuable methods of judging what culture elements have been shared in common before the separation of various groups, what elements have been improved, and what developed as new inventions to meet local requirements or express the peculiar genius of a people.

HOUSES

General Features

The Samoan family living in a settled community required shelter from sun or rain for the two main purposes of cooking, and ordinary living. The form of cooking in the open earth oven did not encourage the combining of the two needs in the same room. The complicated system of dividing the space under one roof into a number of walled-in rooms had not been considered. The climate did not supply such an incentive. The Samoan idea of combatting the heat prevented the use of permanent walls even around the outer margins of their permanent dwelling houses. Each roof, therefore, covered but one room. Cooking and living were permanently separated into two distinct buildings, the *fale umu* and the *fale o'o*. The introduction of benzine tins, pots, kettles and a few stoves has led to a small part of the population doing the cooking of small meals in the dwelling house. On the other hand, people of a more advanced culture have found it advantageous to follow the Polynesian custom of having a separate cooking house.

The cooking house was merely a roof propped up in the air; no provision for side walls or floor were required. The roof was originally propped up in one of two ways, to which was added an adaptation from the dwelling house. This produced three types of cooking houses.

The dwelling house from the very nature of its use required more care and detail. The problem of supporting the roof was met in two ways. Sleeping on the floor demanded that provision should be made against damp and an even surface provided for floor mats. The material requisitioned was not wood but stone. While free circulation of air was obtained by open sides, protection against cold winds and driving rain was provided by wall screens which could be dropped in any part and raised again when the necessity ceased. As the house served as both bedroom and sitting room for the family, it had to be sufficiently commodious to meet these requirements. These houses are all of the one shape, the long rectangular middle portion *(itu)* with rounded portions *(tala)* added to either end. The use of various timbers has led to a variety of names being applied but they are included under the type name of *fale o'o*. Besides superior timber, better material was used for thatch and lashing. In the less elaborate dwelling houses, there were no technical details that were beyond the scope of the householder.

With the development of the social side of life, a further need was created. The head of the family required a place where he could meet the heads of other families to discuss matters of common importance to the family groups in the village. This extended to the meeting of the heads of families or groups of families from other villages united by a common bond. It extended

further to the proper reception and housing of visitors from other parts. The dwelling house was used for the ordinary domestic requirements of everyday life. To meet further demands, the guest house was created. Its construction was based on that of the *fale o'o* (a long house with rounded ends). The simplest long house is the canoe shed *(afolau)*. Any house preserving the long character of the part between the ends is referred to as *fa'aafolau,* after the style of an *afolau.* Thus the *fale o'o,* according to the Samoans, is a *fale fa'aafolau* but *fa'a* (like, resembling) was dropped and it became *fale afolau.* The term *fale afolau* is used as a general descriptive term but through usage, it is specifically applied to the long guest house. To meet the extra demands of accommodation and ceremonial, the *fale afolau* guest house was built much larger than the ordinary *fale o'o* dwelling house.

The increasing complexity of ceremonial that developed out of social organization, made further demands on house construction. The guest house was the place where speakers met in fono (council). In the house the Samoans speak, sitting on the ground, and do not change from the position assigned by etiquette. The middle of the rounded ends became the places of highest honor; one for the highest ranking chief of the village, and the other for the similar rank amongst the visitors. In the long house, the two ends were too far apart for convenient hearing. The objection was met by bringing the two rounded ends closer together. This was done by cutting down the length of the middle straight portion *(itu)* to six or seven feet. In this type of guest house, the side length was reduced to a working minimum and the name of *fale afolau* was no longer applicable. The sacrifice in length was compensated somewhat by increased width. The height of the roof was increased to meet other requirements that arose so that the house towered up above the others and looked larger. It was thus named *fale tele* (big house). The approximation of the two ends gave the house a rounder appearance and has led to the term "round house." The term is useful but the roundness was not the feature considered by the Samoans in the application of the term *fale tele.* The *fale tele* is the big house and the roundness is accepted but not specified. The idea of greatness is also conveyed in *tele* from the function of the house.

The greater size and ornamental requirements of the guest houses involved technical details in construction that were beyond the compass of the ordinary individual. By means of split lengths of wood, the householder could cope with the curved purlins of the rounded ends of an ordinary dwelling house. The greater arch of the guest house, however, could be formed only from short curved pieces fitted together. Expert skill was needed. The greater technical details involved led to the development of a craft of builders. Through specialization, a distinct type of building was evolved. To maintain their own status, the chiefs had to have the very best the builders could pro-

vide. The builders thus attained great power. They became organized into guilds with rules and regulations that chiefs of the highest status could not afford to disregard. A builders' union came into existence. The individual could build his kitchen and the ordinary dwelling house but guest houses required a contract with highly paid specialists.

In describing the various types of Samoan houses, it is better to follow their natural evolution and work upwards from the simplest forms to the highly organized guest houses.

TERMINOLOGY

To understand the difficulty of adopting the terms used in architecture, it is necessary to stress that in constructing the framework, a different order was pursued to that for which the words in English dictionaries were framed. After the ridgepole had been supported in position, the rafters were attached to it. The rafters were then supported by temporary struts and the wall plates and purlins attached to the rafters. In the guest houses, the purlins were attached to the inner and not the outer side of the rafters. Collar beams were then stretched, not between opposite pairs of rafters, but between opposite principal purlins. The collar beams thus took the main part of the weight of the roof. The wall posts were added last and were usually left to the unskilled labor of the owner's family. The framework was built in three sections; the middle rectangular section first, and then the two end sections. In the rounded end sections, the purlins had to be arched.

Beams are horizontal elements of the framework running transversely to the long axis of the building. There are two kinds: collar beams *(so'a)* extend between opposite principal purlins and are lashed to them and to the middle supporting posts or the king posts, thus preventing the inward thrust of the rafters due to the weight of the roof; a tie beam (*utupoto*) is supported on an opposite pair of lateral supporting posts and supports the king post.

An eave batten (*langolau, niufafo,* or *atuao*) is attached to the outer side of the lower ends of the rafters. It supports the lowest layer of thatch and assists in defining the eaves.

Posts *(pou)* are vertical elements which support the roof. There are three forms: the king post *(pou 'au'au* or *te'e 'au'au)* extends between the tie beam and the ridgepole to both of which it is lashed; supporting posts *(pou tu)* support the ridgepole either directly by being placed in the middle line or indirectly by being placed laterally in opposite pairs which support a tie beam and a king post; wall posts (*pou lalo*) are placed round the outer margin of the house and are lashed to the wall plate.

Purlins *(fa'alava)*. The purlins are elements placed between the ridgepole and the wall plate supporting the rafters at right angles. There are three kinds: principal side purlins (*fatafata-a-fale, la'au matua,* or *amoamo*) are straight purlins in the middle section of the house; principal end purlins *(fau)* are arched purlins in the rounded end sections; intermediate purlins (*luanga* or *pae'aso*) are slender rods spaced between the principal purlins in all sections of the house.

Rafters. These oblique elements, which, by extending between the ridgepole and the wall plate, give slope to the roof, are of two kinds: principal rafters *(iviivi, la'au fange'a* or *fatunga)*, stout rafters which give support to the principal purlins and the wall plate;

and thatch rafters *('aso)*, slender rods to which the roof thatch is attached. They correspond to the common rafters in architecture.

Ridgepoles. The ridgepole forms the ridge of the roof. Of these, there are two: the principal ridgepole *('au'au)*, directly supported by supporting posts or king posts and supporting the rafters of the middle section of the house; the upper ridgepole *('au'au lunga)* is smaller and runs parallel above the principal ridgepole. It is supported on the crossed upper ends of the rafters and is used for securing the ridge sheets.

Struts *(te'e)*. These are timbers used in construction to resist thrust or lengthwise pressure. Except for a few in the long guest house, they are of a temporary nature.

Wall plate *(amo pou* and *fau lalo)*. This is the horizontal element which extends between the upper ends of the wall posts giving some support, in the completed house, to the rafters. Those of the middle section are the *amo pou*. The *fau lalo* is the curved wall plate of the rounded end sections and really corresponds to a curb plate.

TYPES OF HOUSES

Carpenter Shed

The carpenters' shed *(fale ta)*, though used in connection with the construction of the highest type of houses, is in itself merely a rough leanto roof, supported by three forked stakes at the back and the front. (See fig. 1.) The roof of horizontal poles and cross pieces covered by coconut leaf sheets overlapped from behind forwards, is sufficient to afford shelter from the sun and from a moderate amount of rain. Within the shed, the older carpenters sat cross-legged trimming timber with their short handled adzes and shaping the joints of the thatch rafters and the principal purlins. The *fale ta* (fig. 1) was seen in use on the island of Ofu.

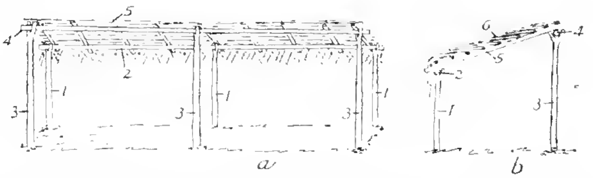


Figure 1.—Carpenter's shed about 18 feet long and 6 feet wide: *a*, front view; *b*, cross section: 1, back stakes; 2, back pole; 3, front stakes about 2 feet longer than back stakes; 4, front pole; 5, rafters; 6, sheets of coconut leaves.

Similar sheds seen at other places were merely covered with coconut leaves and even the rounded end section of an old house was seen in use. The name *fale ta (fale,* house; *ta,* to strike, as in using an adz) refers to the function of the carpenter's shed and may be applied to any shape of building used for this purpose. Because of the ease of construction the leanto shed was the usual form for these buildings.

CANOE SHED

The canoe shed *(afolau)* provided shelter from the sun for the large canoes. With the disappearance of the large canoes, such sheds are used to

house the large *fautasi* boats made on European lines. The structure was built sufficiently wide to accommodate the vessel with a little clearance on either side. The problem was to support a roof without impeding the entrance and exit of the canoe and leaving the ends of the shed open. It was solved by doing without supporting posts. Two *afolau* that retained the old characteristics were examined and explained at Asau and Tufutafoe, Savaii.

In the shed at Tufutafoe (fig. 2) the ridgepole was supported by pairs of curved poles or rafters that were lashed to a wall plate and continued downwards into the ground so as to prevent the outward displacement of the lower ends of the rafters by the downward pressure of the ridgepole and the weight of the roof. Some rafters though lashed to the wall plate did not reach the ground. Ordinary poles were used throughout. The wall posts were thicker than the main rafters and the thatch rafters much thinner. The purlins were stout poles—small intermediate poles were absent and the lowest purlin so placed as to throw the thatch clear of the wall plate. The thatch sheets of plaited coconut leaves were overlapped from below upwards and tied to the thatch rafters in the usual manner. The coconut leaf ridge sheets were pinned through below the upper ridge pole. (See p. 64.) Hau (*fau*) bark was used for the lashing.

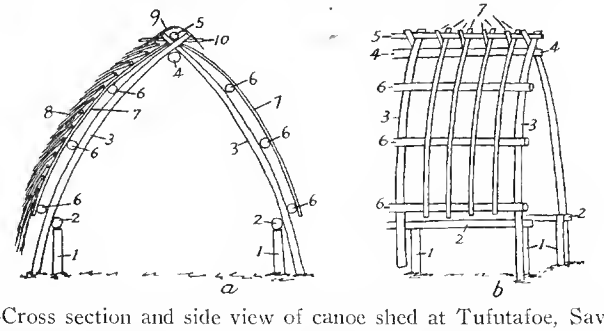


FIGURE 2.—Cross section and side view of canoe shed at Tufutafoe, Savaii: *a*, front; *b*, side: 1, side posts (*pou lalo*) 2 feet 6 inches high, in 2 lines 10 feet apart; 2, wall plates extending the length of the shed; 3, curved rafters (*iviivi*) arranged in pairs spaced 4.5 to 5 feet apart—the crossed upper ends lashed together in a middle line about 10 feet above ground, the lower ends sunk into the ground and lashed to the wall plates; 4, principal ridgepole (*'au'au*) lashed to the crossed rafters on the under side; 5, upper ridge pole (*'au'au lunga*); 6, purlins (*fatafata-a-fale*) stout poles equally spaced, the lowest just above the wall plate; 7, thatch rafters (*'aso*) 16 inches apart, crossed under the upper ridgepole and extended slightly below the lowest purlin; 8, thatch of plaited coconut leaves; 9, ridge sheets of coconut leaves; 10, ridge sheet pin.

The method of supporting the ridgepole with curved rafters alone without any intermediate supporting post or king post is termed *fa'asoata*. A building so constructed is termed *to fa'asoata* (*to*, to build, and *fa'asoata*, with curved rafters, no supporting post). The word *afolau* (canoe shed) is widely spread in Polynesia. In Tahiti, *farau*, is a shed for a canoe, and in the Tuamotus, *horau* is a shed. In Hawaii, *halau* is a long house with the end in front, used mostly for canoes. In Maori, *wharau* has come to mean a particular kind of long house, but also means a rough shed which included that built over a canoe. In the Moriori dialect of the Chatham Islands, *wharau* is a ship.

COOKING HOUSES

TYPES AND METHODS OF CONSTRUCTION

The cooking house *(fale umu)* is the house *(fale)* which shelters the earth oven (*umu*). It is also referred to as *umu, piato,* and in chief's language, *tunoa.* It is usually situated a little to the rear of the dwelling house and is used only for actual cooking and the storing of small quantities of uncooked food. As they served no aesthetic purpose, *fale umu* are roughly built. There are three methods of supporting the roof:

(1.) The method of constructing a canoe shed (*to fa'asoata*) was used in the poorest type of cooking house. A *to fa'asoata* seen at Saua, Tau Island, differed in no way from the canoe shed described except that it was shorter and a little higher. The type has gone out of general use, and is only built for temporary use but it was definitely described by informants as one of the two original types of cooking house. Saua, though figuring in song and story, is now used as a fishing camp. It is remarkable that the one such house I saw should have been in one of the earliest villages recorded in association with Tangaloa-ui and the early peopling of the Manuan group of islands.

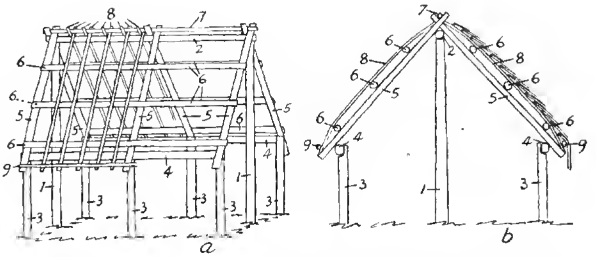


FIGURE 3.—Rectangular section of cooking house (*to sunu'i* type): *a,* side view; *b,* end view: 1, supporting posts (*poutu*) 10 to 12 feet high planted in the ground 8 to 10 feet apart; 2, ridgepole (*'au'au*); 3, wall posts (*pou lalo*) 4 to 6 feet high, sunk into the ground 5 to 6 feet from the supporting posts, their tops forked naturally or artificially shaped to receive the wall plates; 4, wall plates lashed to the outer side of the wall posts; 5, rafters crossed at their upper ends; 6, purlins; 7, upper ridgepole (*'au'au lunga*); 8, thatch rafters (*'aso*); 9, eave battens (*langolau*).

(2.) The second original type of cooking house is the *to sunu'i.* The term *sunu'i* (to thrust into the ground) refers, in connection with building, to an upright post which directly supports the ridgepole. The canoe house from which the *to fa'asoata* type was directly derived could not admit of vertical struts in the middle line. In the cooking house, the objection to the direct form of support vanishes, and the *to sunu'i* method of construction comes naturally into operation.

The *to sunu'i* consists of a middle rectangular section and two rounded ends. The middle section, constructed first (fig. 3), consists of two supporting posts *(pou tu)* that

carry the ridgepole and wall posts (usually three on either side) that carry the wall plates. Three pairs of rafters *(matua)* are next placed in position and across them two or three horizontal purlins and an upper ridgepole *('au'au lunga)* is placed in the forks made by the upper ends of the rafters. Thatch rafters *('aso)* are laid over the purlins, their upper ends first thrust through under the upper ridgepole and an eave batten is attached to the outer side of the lower ends of the thatch rafters. A thatch of plaited coconut leaves completes the building.

The natural poles used are shaped only at the wall posts, where a notch may be cut for receiving the wall plate. The woodwork is lashed together with *fau* bast.

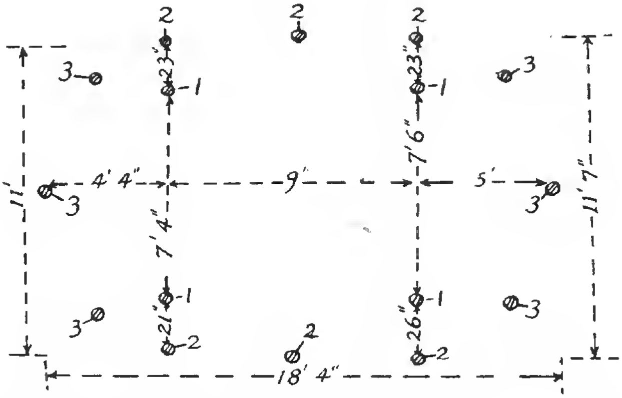


FIGURE 4.—Ground plan of cooking house (*utupoto* type): 1, supporting posts; 2, wall posts of middle section; 3, wall posts of rounded end.

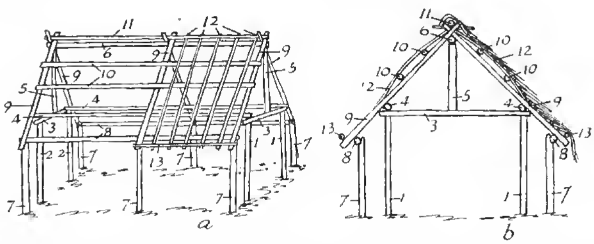


FIGURE 5.—Rectangular section of cooking house (*utupoto* type): *a*, side view; *b*, end view: 1, 2, supporting posts (*pou tu*): 3, transverse tie beams; 4, longitudinal tie beam purlin; 5, king posts; 6, ridgepole; 7, wall posts 26 inches from supporting posts; 8, wall plates; 9, rafters; 10, purlins; 11, upper ridgepole; 12, thatch rafters 12-15 inches apart; 13, eave batten.

(3.) The term *utupoto* refers to the use of a tie beam in supporting the ridgepole prop, and was not included in the two original types of cooking house. The method has been adopted from the more advanced construction of the dwelling house, and *utupoto* has become the commonest form of cooking house. Lalolangi of Fitiuta while maintaining that the *to fa'asoata* and the *to sunu'i* were the two original forms, referred to his own cooking house as a *to fa'asoata*. In it, tie beams were used. The term *fa'asoata* has become

loosely applied to the tie beam type to distinguish it from the type with the middle supporting posts, or *to sunu'i.* In the *to sunu'i* one of the supporting posts is close to the fireplace. To provide more space for the activities around the fire, the offending post was replaced by using the tie beam construction in preference to the curved rafters or true *fa'asoata.* The use of the tie beam in cooking houses is a backward displacement from a more advanced stage in technique. The simple form used in the cooking house indicates the stages through which the dwelling house passed in its evolution to its present form. The ground plan of the Fitiuta cooking house is shown in figure 4 and the elements of the frame of the middle rectangular section in figure 5. (See also Plate I, *A.*)

Across the upper ends of the two pairs of supporting posts *(pou tu)* two transverse tie beams project slightly outward and longitudinal beams *(tatao)* are laid above their ends. From the middle of the transverse tie beams are erected short vertical king posts *(pou 'au'au*; props for the ridgepole) kept in position by temporary diagonal struts lashed to the tie beams. To the upper ends of the king posts is lashed the main ridgepole *('au'au).* Three wall posts are erected and wall plates lashed to the outer side of their upper ends. The position of the wall posts is guided by the fact that the three pairs of rafters must rest on the ridgepole and *tatao.* The longitudinal beam (*tatao*) is a horizontal element to strengthen the roof framework. It is lashed to the ends of the tie beams and rafters are lashed to it. It acts as a purlin—the first to appear on the inner side of the rafters. For convenience it is here referred to as the tie beam purlin.

Two other purlins are attached to the outer side of the rafters. The upper ridgepole is held in the forks formed by the crossed ends of the rafter pairs. The thatch rafters are slender rods *('aso)* laid over the horizontal elements of the frame. To them the eave batten is attached.

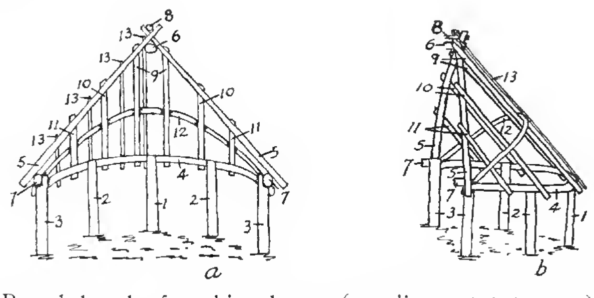


FIGURE 6.—Rounded end of cooking house (*sunu'i* or *utupoto* type): *a,* end view from within; *b,* side view from without: 1, end post; 2, intermediate wall posts; 3, middle section wall posts; 4, curb plate; 5, side and end rafters of middle section; 6, ridgepole; 7, wall plates; 8, upper ridgepole; 9, first, longest pair of end rafters; 10, second pair of end rafters; 11, third pair of end rafters; 12, curved purlin; 13, thatch rafters.

While thatching the middle section of a house of the *to sunu'i* or *utupoto* type, the framework of one of the rounded ends *(tala)* proceeds.

An end wall post in the middle longitudinal line of the rectangular section of the house and intermediate wall posts on either side are erected to form a curve. A long pole is tied at its middle to the end post bent round the outside of the intermediate wall posts and tied to the two end wall posts of the middle section to form a curved wall plate or curb plate *(fau lalo).* The green wood readily takes the curve when the end post is

not too far out but in some houses, two poles were used and the ends overlapped. Three pairs of end rafters are stretched between the side rafters and the curb plate. The first and longest pair is on either side of the middle line and above the level where the highest side purlins cross the side rafter; the second pair cross the side rafter at the level of the second purlin, and the third pair cross at the level of the tie beam purlin. The upper ends are lashed to the side rafters, the lower ends are spaced about equally on the curb plate and lashed to it.

To brace the rafters together a curved pole that functions as a purlin is introduced. It passes on the outer side of the rafters, is tied approximately to their middle, and its ends rest on the curb plate at its junction with the side wall posts. It is thus not only curved but runs obliquely upwards to the middle line from either side. Curved purlins in the *tala* end are termed *fau,* and one occupying a middle position (fig. 6, 12) is distinguished as *fau tu*. The curved purlin is in one piece, but in order to more readily take the curve, the pole is thinned by splitting off a section on either side. Such a purlin is termed a *fau sasae (sasae*: to tear or split off). The *fau sasae* of the cooking house is important as it formed the precursor of the very elaborate curved purlins used in guest houses.

The curved purlin not only braces the end rafters but it supports the thatch rafters which are tied to it as well as to the side rafters and wall plates (fig. 6*a,* 13). It thus prevents these slender rods from sagging between the side rafters and the curb plate, and hence performs a function similar to the straight purlins of the middle section. Beginning at the middle line the thatch rafters are attached more closely together. To their lower ends is attached the eave batten. Figure 6*b* shows that the roof slope of the *tala* is straight between the side rafters and the curb plate.

The other end section is constructed in the same way. The roof is thatched over with plaited coconut leaves, the curved ends presenting no technical difficulties. The floor is not paved unless low lying ground necessitates it for the rainy season. In some stony regions, such as Fitiuta, terraces on the inland side of the village are built up with stone on the downward sloping side of the hill. Stonework is here a necessity and not of such cultural signficance as where the stone has to be transported some distance. Though exact measurements are given in the ground plan, their irregularity illustrates the fact that approximations by eye were used and no checking of distances by measuring with a cord. A few inches here or there caused no difficulties in construction. The type of building was not worth any extra trouble.

DWELLING HOUSES

The ordinary dwelling houses are usually termed *fale o'o* and are situated at the back of the guest houses which they serve. They are also termed *fale vao* from the material used. Here *vao* (forest) signifies any of the timbers of the forest except breadfruit which is cultivated. Dwelling houses vary in construction according to the means of the family. The better-built ones derive their technique from the guest houses built by skilled labor. The humble and presumably more ancient type are those situated near cultivations

or, being owned by less affluent families, have been erected by less skilled labor. Unskilled labor makes more use of the earlier technical methods employed in the cooking house, which a guild carpenter would consider beneath the dignity of his craft. Both the median supporting post and the tie beam methods of supporting the ridgepole are in use, but the tie beam is the more common. A house seen near a cultivation in Tutuila complied most with study requirements. (See figure 7.)

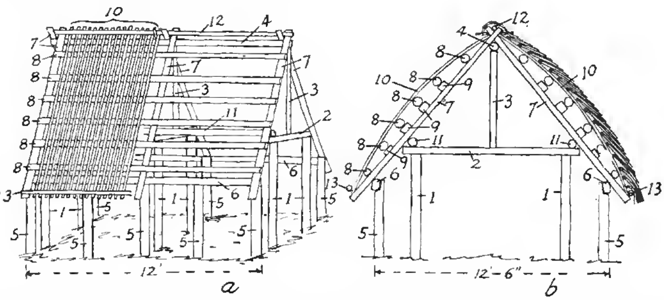


FIGURE 7.—Ordinary dwelling house (*fale o'o*) 23 feet long, middle section 12 feet long by 12 feet 6 inches wide with 5 wall posts on either side, 1 opposite each supporting post and others in the middle of the spaces: *a*, side view; *b*, front: 1, 3 pairs of supporting posts; 2, tie beams; 3, king posts; 4, ridgepole, 12 foot; 5, wall posts; 6, wall plate fitted to notches cut square on the outer side of the upper ends of the wall posts; 7, three pairs of strong straight poles used as rafters (*la'au fange'a*) a pair at each end and one midway; 8, six horizontal straight purlins (*la'au fa'alava*) evenly spaced on either side outside the rafters; 9, graduated chocks of wood placed between rafters and the 4 intermediate purlins, so arranged that the deeper chocks are toward the middle; 10, thatch rafters; 11, tie beam purlins; 12, upper ridgepole; 13, eave battens.

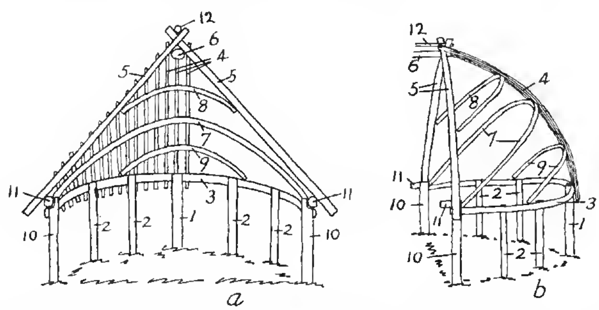


FIGURE 8.—Rounded end section of dwelling house (*fale o'o*): *a*, end view from within; *b*, side view: 1, end wall post; 2, two intermediate reinforcing posts; 3, curb plate; 4, thatch rafters; 5, end rafters of middle section; 6, ridgepole; 7, curved purlin (*fau tu*); 8, top purlin; 9, bottom purlin; 10, middle section wall posts; 11, wall plate; 12, upper ridgepole.

The principal rafters were strong stout poles and the purlins were still attached to their outer side. The feature of the construction was the insertion of graduated chocks of wood between the rafters and the purlins.

The effect produced when the thatch rafters are applied, is an evenly curved roof slope. The tie beam purlins though they still assist in supporting the rafters are now

definitely separated from the thatch rafters by the addition of the lower purlins which removes the awkward curve shown in the tie beam type of cooking house. (See fig. 5*b*.) The rafters, ridgepole, and the eave battens were as in the cooking house. The end sections (fig. 8) show a marked change. The straight end rafters of the cooking house (fig. 6) disappear altogether and their function is discharged by an increased number of curved purlins. The end wall post is reinforced by two intermediate wall posts on either side to support the curb plate. A number of thatch rafters are stretched in the middle line by being attached to the end side rafters of the middle section, near the ridgepole. The lower ends hang over the middle part of the curb plate. Three curved purlins of the split *fau sasae* kind are now placed in position.

The middle one *(fau tu)* bisects the end section of the framework and its lower ends rest on the curb plate at its junction with the wall posts of the side section as in the case of the single curved purlin of the cooking house. The top purlin is midway between the middle purlin and the ridgepole in the middle line. It runs parallel with the middle purlin and its ends rest against the side rafters about midway up. The bottom purlin is midway between the middle purlin and the curb plate in the middle line. It also runs parallel with it and its ends rest on the curb plate. While the purlins keep the thatch rafters in a lateral or transverse curve, they also form a longitudinal curve from the side rafters to the curb plate. This curve is formed by tying the middle purlin in the middle line to the thatch rafters mentioned and then propping it up from below with temporary struts. The same is done with the other two purlins until the longitudinal curve is obtained. (See fig. 8*b*.) The thatch rafters are tied to the rafters above, to the purlins, and finally to the curb plate, the additions working out from the middle line to either side. The purlins are curved in as the work proceeds and the extra lengths at the ends cut off to fit against the parts mentioned. The thatch rafters are set as closely together as three inches. The eave batten takes its usual place.

Attention must again be drawn to the use of chocks (fig. 7*b*, 9) between the principal rafters and the straight purlins of the sides to produce a curved roof. Compare this with the straight slope in the cooking house. The abandoning of the principal rafters in the end sections is an important step. The transference of their function to the curved purlins has been due to the desire to continue the curved slope of the roof of the middle section to that of the ends. The downward slope of the end roof in the cooking house is straight, and the single purlin used is merely to prevent the sagging of the slender thatch rafters between the stiff principal rafters. It is quite probable that chocks may have been used to raise the curved purlin above the straight end rafters. A curve, however, requires to be graduated, and an extra purlin above and below the middle *fau tu* eased the problem. More careful work in the dwelling house brought the thatch rafters closely together. When they were lashed to three purlins instead of one, their strength became evident. They were quite strong enough to carry the weight of thatch and brace the end section together. The principal end rafters became unnecessary and were abandoned in the dwelling house. The curved purlins were readily adapted to the required roof curve by being tied to the mesial thatch rafters and then propped up in the middle line to comply with it. The ends were purposely left long and as the addition of the thatch rafters brought them round laterally their subsequent length was settled automatically. No builder calculated out the exact length of split curved purlins beforehand but he let the work

do it for him. The curved purlins thus became important arches from a very humble beginning.

The wooden chocks, if they were used, disappeared with the straight principal rafters that gave them support. In the middle section both rafters and chocks remained as a better solution for the curve of the side roof was beyond the means of the builders of the humbler type of dwelling house. It had to await the more affluent circumstances of the guest house.

Sennit braid was used for lashing both framework and thatch. Thatch sheets were put on more closely together, and the ends were cut off evenly below the eave batten. Sugar cane leaves replaced coconut leaves in good houses.

The median supporting posts were seen in a *fale o'o* at Falesao, Tau. The dimensions were practically the same as in the house described. See p. 17.) There were two median supporting posts and three curved purlins at either end.

The floor was built up of stone after the completion of the building, and smaller stones spread over the surface. Wall screens of plaited coconut leaf are used in all dwelling houses.

GUEST HOUSES

The guest houses occupied the front lines in all villages. They consisted of two types; the long house *(fale afolau)*, and the round house *(fale tele)*. They were built of the best material. Tradition has it that when the original guild was ordered by Tangaloa-langi to choose timber from the forest for the building of the first house, Malama selected the breadfruit (*'ulu*). This received heavenly approbation and breadfruit has been the correct timber since that incident. Thus, except for the long principal rafters and sometimes the supporting posts, breadfruit is the only timber for a proper guest house. The house is then called a *fale 'ulu* in distinction to the *fale vao*, built of any timber. The *fale 'ulu* type became associated with chieftainship, and one of the most disparaging taunts is to tell a man that his father never lived in a *fale 'ulu*.

The guest house in addition to material, size, and shape, was decorated with ornamental lashings in sennit braid. They were built by skilled carpenters belonging to an ancient guild, and involved much expense in food and ceremonial gifts which took the place of a set estimate of cost. The chief had to summon his people to his assistance. For months beforehand the interminable plaiting of sennit braid went on and was stored in large coils. Fine mats had to be accumulated in sufficient number and extra work in the cultivation was necessary to provide food for the extra demand. The chief had to provide all material (timber, sennit braid, and *fau* bark for temporary lashings) and transport it to the site. He had also to feed the guild during

the whole time they were at work and pay them with food and fine mats on the completion of the house. The type of house therefore depended on the wealth of the family, and the finish of the various parts on the way in which the carpenters were fed. A guest house was no light financial undertaking, but pride and prestige had to be adequately housed.

THE LONG GUEST HOUSE

The long house *(fale afolau)* is presumably the older form as it could be more directly derived from the dwelling house. Some of the older men of Tau stated that the first house built by the Sa Tangaloa was a long house. The long house has been described by Handy (14, p. 4). Detailed description here will therefore be deferred to the round house, but a brief descrip-

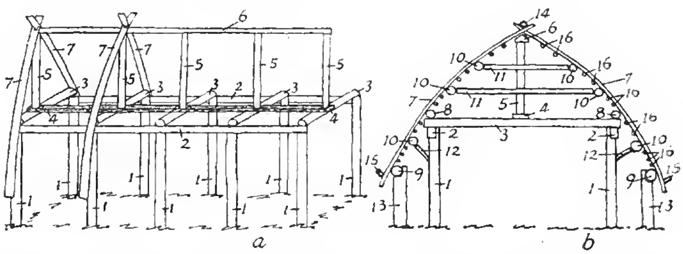


FIGURE 9.—Long guest house (*fale afolau*): *a*, side; *b*, section through timbers; 1, supporting posts; 2, longitudinal main plates; 3, solid tie beams; 4, longitudinal squared beam (*tuitui*); 5, king posts; 6, main ridgepole; 7, principal rafters; 8, tie beam purlins; 9, wall plates; 10, ordinary purlins; 11, collar beams; 12, short strut (*te'e*); 13, wall posts; 14, upper ridgepole; 15, eave batten; 16, intermediate small purlins.

tion of the parts of the long house is necessary to ensure the continuity of this study. (See Plate I, *B*.)

The size of the house was regulated by the number of tie beams *(utupoto)* desired by the owner. They range from 4 to 6. In figure 9, an average of 5 tie beams is depicted. Five opposite pairs of supporting posts are arranged in 2 rows. An advance on the dwelling houses is made by attaching longitudinal main plates to the outer side of the upper ends of the 2 rows of supporting posts. The posts are cut to receive the main plates which are set flush with the upper ends of the posts. Five solid tie beams, squared or round, are set transversely across, resting on both the main plate and the upper ends of the opposite pairs of posts. The main plate here receives the name of *amo pou*, previously applied to the wall plate.

Another new element appears in the form of a longitudinal squared beam termed a *tuitui*, which is laid above the tie beams in the middle line. Five king posts *(te'e'au'au* or *pou'au'au)* are set up on the *tuitui* above the crossings with the tie beams. In the previous houses, the king posts rested directly on the tie beams. As before, the king posts are temporarily strutted and the main ridgepole placed on their upper ends and lashed. The ridgepole is a solid piece of worked timber. The principal rafters, dubbed out of coconut wood, are hung in pairs over the ridgepole, a pair directly above each king post. Two such pairs are shown on the left of figure 9*a*.

Two tie beam purlins *(tatao)* are placed in the usual position over the ends of the tie beams. (See fig. 9*b*, 8.) They now take the support of the rafters from the ends of the tie beams. The positions of the wall plates on the rafters is judged on one rafter and the distance to the ridgepole measured off on a cord. The distance is then marked off on

the rafters, and the wall plates attached. Judgment is exercised in dividing up the rafter space between wall plate and ridgepole in equal distances for the purlins of which the already fixed tie beam purlins form one pair. The number is divided and the positions marked on the rafters. The tie beam purlins and the wall plates are both attached on the inner side of the rafters. The wall plates now really function as purlins, for as the wall posts are not put in until the last, their primary function of being attached to the top of wall posts to give support to rigid rafters stretched between them and the ridgepole has been lost. The other purlins now follow the wall plates and tie beam rafters by being attached on the inner side of the rafters. The cross section (fig. 9*b*) shows this important step where the wall plates, the tie beam purlins, and the ordinary purlins are all on the inner side of the rafters.

The relative position of the purlins has been changed to obtain a curved slope to the roof. The method of the humbler dwelling house by means of chocks between rigid rafters and external purlins was the work of unskilled labor. Skilled labor obtained the like result by using flexible rafters of coconut wood and bending them out with temporary struts, as in the rounded ends, until the required curve was obtained. The question was how to maintain the curve when the struts were removed. This was simple for the tie beam purlins gave a guide. The external purlins were therefore changed in position to the inner side of the rafters, and from the tie beams was developed the use of the collar beams which acted as struts between opposite pairs of purlins and by keeping them apart maintained the curve of the roof. A collar beam was thus stretched between each opposite pair of purlins above the level of the tie beams. They are tied at each end to the purlins, and in the middle to the king posts in the transverse lines of which they are arranged. A transverse beam below the level of the tie beams would spoil the effect, therefore, when necessary, a short strut (*te'e*) was stretched between the lower purlins and the supporting posts. When the rafters are curved by the temporary struts, their lower ends have to be tied temporarily to the scaffolding to fix the lower end of the curve. The wall posts are last of all put in below the line of the wall plate, and the lashing of the wall plate to them permanently fixes the lower end of the roof curve. The thatch rafters are set closely together. The upper ends pass under the upper ridgepole and they are lashed with sennit to each purlin and the wall plates. As the purlins are now all on the inner side of the principal rafters, the thatch rafters rest evenly on them in like manner with the thin principal rafters, and on the same plane. They can not therefore be shown in the section in figure 9*b*. Across the lower end of the rafters rests the eave batten which is now a proper worked batten instead of a pole. Intermediate, small purlins are a new feature and are shown in position.

The rounded ends are of similar technique to the round house. The best made long house seen was that owned by the Ripley family in Leone. It had three pairs of purlins above the tie beam and two below it. With the lowest tier of collar beams, one passed on either side of each king post. The purlins below the tie beam purlin were not strutted. Many of the older churches are large long houses, and very long ones are still built as schools and in connection with pastors' residences.

The better class dwelling houses are built on the basis of the above technique.

The long house has the advantage of a clear middle space. The disadvantage lies in the convenient use of the wall posts to lean against being obstructed in view by the two lines of supporting posts. In feasts and gatherings, the guests therefore have to sit to the inner side of the supporting posts while the attendants sit between the main posts and the wall posts. The people at the ends also sit in closer to reduce the distance, and are thus de-

prived of their leaning posts. Probably only the quadrangular middle part was in use in eeremonials. In the round house the above disadvantages were overcome.

THE ROUND GUEST HOUSE

PREPARATION

The round guest house (*fale tele*) is essentially a *fono* house in which public meetings and the reception and entertainment of visitors take place. Inseparably connected with this is the ceremonial distribution of kava. In construction, two main requirements must be served; the rounded end sections brought closer together, and the side wall to the interior left unobstructed. To meet the first requirement, the long middle section of the *fale afolau* was reduced to a range of from 6 to 8 feet according to the size of the house. To meet the second requirement the lateral line of main posts near the front had to be removed. This could not be done without removing the rear line of main posts and thus the tie beam and king post method of supporting the ridgepole had to be abandoned. Reeourse was had to the middle main post or *to sunu'i* method of support. (See plate I, *C*.)

Details of construction and technique, omitted from the description of the long house, will now be given. The processes will be taken in order, not only to draw attention to the human factors concerned, but to show how the principles of building became changed under the influence of a special building craft.

The main posts were sometimes of breadfruit, but failing this, *ifi lele* and *pou muli* were used. The long, principal rafters had to be of flexible wood, and coconut wood was always selected. The wall posts were unimportant. For all other elements of the framework, such as straight, curved, and intermediate purlins, wall plate, curb plate, and thatch rafters, the material was breadfruit wood. The old breadfruit trees that had ceased to bear well were the most suitable for building material. The thatch was of sugar cane leaf pinned together over a thin rod to form sheets. When sugar cane was not available the leaflets of the coconut palms were used with a similar technique. All lashings of a permanent nature were of sennit braid while *fau* bark was used for the scaffolding.

The builders were responsible for the skilled work in preparing the woodwork and erecting the frame. The erection of the wall posts and the thatching of the roof was beneath their dignity. A few wall posts deemed necessary as struts might be erected and lashed but the others were left out.

The owner *(taufale)* was responsible for all material and transport to the house site. One of the builders selected the trees suitable for the main posts. The family of the *taufale* cut them down in the forest and dragged and carried them to the site. When the posts were very large and at considerable dis-

tance, the carrying party *(auamo)* had to be requisitioned from the males of the entire village. For their food and refreshment, the *taufale* was responsible.

The women folk of the family of the *taufale* made the thatch sheets. They carried the leaves down from the plantations, and carried on their work while the timber was being prepared. The shifting of heavy timbers and the erection of the scaffolding was done by the party of the *taufale*. They also thatched the roof and completed the fitting in of the wall posts.

Where more suitable timber was on the property of another person, the builder told the *taufale* to ask the owner for it. The special term *fa'aune* was used—*fa'aune mai le la'au* (ask for the timber). To *fa'aune* involved extra expense on the *taufale*.

After a preliminary gift to the head builder, the builder and the *taufale* met ceremonially; a contract defining their mutual relationship during building operations was verbally made, agreed to, and sealed with the kava ceremony.

The builders, after being mobilized, were assigned to a house in the village for their occupation. They brought nothing except their own clothing and the carpenters' tools *(fa'atufunganga)*. The tools consist, in these days, of hatchet heads and plane blades hafted to short handles as adzes. The plane blades range in size and all are lashed to the hafts with sennit braid in a manner similar to the old stone adzes.

The rough carpenter's shed *(fale ta)* was erected near the house site. It contained no equipment in the way of benches. The preparation of timber took place on the ground. Saws are rarely used, but carpenters' planes are now in requisition. Plans, paper and pencils are not used even now. The builder carries the plan in his head and it develops with the building. Charcoal takes the place of carpenters' pencils. The longer measurements are judged by eye, and a piece of sennit braid takes the place of measuring tape and rule. The builders are not restricted by exact measurements calculated out beforehand, but problems of measurement are met as they occur.

The regular meals, drinking nuts, and kava are all provided by the *taufale*. Some of his family are constantly in attendance to administer to the creature needs of the builders. The *taufale* himself spends a considerable part of his time in the carpenters' shed winding the large coils of sennit braid into the smaller working hanks used by the builders, and chatting and gossiping to demonstrate his interest in the builders' welfare. It requires a good diplomat to ensure the smooth progress of the work.

Ground plan. The ground plan of Tufele's round house at Fitiuta, Tau (fig. 10) gives an idea of the ground dimensions of a fair sized house. In the middle section *(itu)*, the wall plate on one side is 7 feet, 6 inches, and 4 inches shorter on the other side. The two end sections *(tala)* also differ by

1 foot 1 inch. In an architect's plan such differences would lead to complications in calculations, but to the Samoan builders, without calculations, such differences caused no trouble whatever. The greatest length of the house is

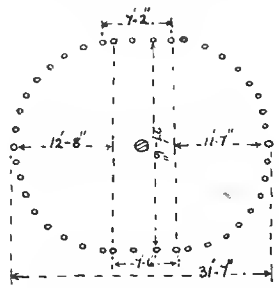


FIGURE 10.—Ground plan of round house (*fale tele*).

the middle longitudinal line between the middle posts of the end sections; the greatest width is across the middle section from side to side. In the largest round house seen at Iva in Savaii, the measurements were 54 feet, 8 inches by 45 feet, 6 inches. The reduced middle section still retains the name of *itu* (side). Though it loses in length it gains in width from the greater spread of the roof which is higher than in long houses. The part facing the street is *luma* (front), and the opposite, *tua* (back). The round house is always built with its long diameter parallel with the village street. The two end sections continue to bear the name *tala*.

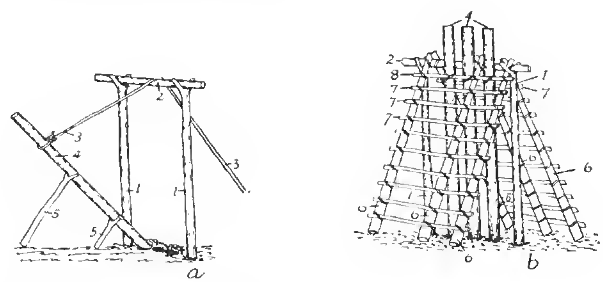


FIGURE 11.—*a*, method of raising posts into position by rope passed over scaffolding cross beam; *b*, continuation of construction: Scaffolding for midde section of house: 1, forked uprights (*to'o manga*); 2, horizontal cross bar (*la'au fa'alava*); 3, rope; 4, main supporting posts; 5, forked struts; 6, oblique pairs of timber; 7, horizontal cross pieces (*papani* or *teleteleanga*).

Scaffolding. For larger dwelling houses and guest houses a proper scaffolding (*fatāmanu*) is erected before construction commences. The name is derived from *fata* (a raised shelf or support), and Manu (a member of the original guild constituted by Tangaloa-matua). In Tutuila, Manu was said to have suggested the scaffolding, but in Manua, he was said to have held

that a house could be built without one. Hence the saying for projects that have no hope of success: "Ai o Manu e le tau" (like Manu, it will not arrive at anything). Whichever way it was Manu has had his name handed down in the scaffolding that he either proposed or despised, for *fatamanu* is a contraction of *fata-a-manu* (scaffolding of Manu).

The scaffolding, erected by the owner's family, was made on set lines based on the construction of the roof of the *to sunu'i* type of building.

The position of the main posts of the projected house were marked by the master builder on the site indicated by the owner. To one side of the line to be occupied by the main supporting posts, and corresponding with the ends of the middle section, two long, forked uprights *(to'o manga)* were set up in the ground. Their height was about 3.5 feet less than the proposed height of the ridgepole from the ground. (See fig. 11.) A horizontal crossbar (*la'au fa'alava*) was laid over the forked ends like a ridgepole. Before the scaffolding was completed the main supporting posts of the house were erected, but not permanently. The holes were dug, the posts carried to them, and the butt end of one placed at the edge of a hole. A rope was tied round the post toward its upper end, and passed over the scaffolding cross beam. The post was raised gradually at its top end by men lifting it; forked struts placed under it while a party on the end of the rope kept it taut. In this way, the posts were gradually raised into a perpendicular position and worked into the holes. When the three, or whatever the number, were raised, the scaffolding construction was continued.

Three oblique pairs of timbers (fig. 11*b*) were rested against the crossbar like rafters. Their lower ends rested on the ground just beyond where the wall posts would come. In the figure they are rather too upright. The oblique timbers are termed *fata vala* in Tutuila and *fata sasau* in Manua. Horizontal cross pieces *(papani* or *teleteleanga)* were lastly tied to the oblique timbers to act as steps or rungs from which the builders could reach every part of the framework as it was being constructed. The main supporting posts of the house were then held perpedicular and lashed in position either to the ridgepole or to a more convenient cross piece.

The scaffolding described is the set type for the middle section of long or round houses. In the long house, it is made to agree in length with the section being built. The upright forked posts, with a ridgepole, oblique rafters-like structures, and purlin-like cross pieces, is merely a roof framework within a framework. The scaffolding for the rounded end sections was not put up until it was needed. The lashings of the scaffolding were made throughout of long strips of *fau* bark about two inches wide. The material was provided in bundles by the owner's family. The lashing followed the set form shown in figure 12.

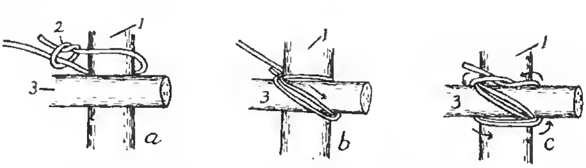


FIGURE 12.—Lashing of the scaffolding: *a*, fixation of lashing; *b*, lashing in oblique turns around two wooden elements; *c*, final circumferential turn of strip around lashing between wooden elements: 1, oblique timber, fixed wooden element; 2, single overhand running noose or slip knot; 3, cross piece.

One end of the strip is passed round the fixed element (the oblique timbers in figure 11*b*) and tied round itself with a single overhand knot. This forms a running noose or slip knot which is the orthodox commencement of most Samoan lashings whether temporary or permanent, and it will be referred to throughout as the running noose commencement. The noose is drawn taut at the exact spot required on the stationary timber, and the cross piece is placed in position. A number of oblique turns are then made in the one direction round the two wooden elements. (See fig. 12*b*.) In making these turns, the strip is drawn taut with the right hand, which may be assisted by the weight of the body. When sufficiently tight, the left thumb holds the strip against the wood while the right hand passes the strip round the timber. This method is quick and effective, and demands that one end of the binding material be first fixed so that only a single strip demands the attention of the two hands. Two or three turns are usually sufficient. The last step (fig. 12*c*) consists of making one or more turns round the lashings between the two wooden elements as indicated by the arrows in the figure. Before the last circumferential turn is tightened (fig. 12*c*), the strip end is passed under it. The turn is drawn taut and further tightened by pulling the end not in the direction of the arrows, but back in the opposite direction. These circumferential turns (*langolango*) are always used to tighten up the lashing.

The term *fa'atunga* means the causing to stand upright. It applies to the erection of the main posts and marks an important stage in construction which in all important houses must be celebrated by feasting. The term *fa'atunga* thus applies to the ceremonial giving of food, and feasting, as well as the official erection of the main posts. I was fortunate enough to see the full ceremonial in connection with the building of the house of Misa, high chief of the island of Ofu.

The proceedings opened with the special morning meal termed *(lavatasi)*. The working party of the *taufale* appeared and assisted by lifting the main posts to the right level indicated by the builders. This was done by tying two horizontal bars to the post at right angles with each other. The laborers got their shoulders under the bars and lifted while another laborer shoveled stones and earth under the post, which was then held vertical while the sides of the hole were filled in and rammed tight. The builders directed operations from the top of the scaffolding. Of the three main posts, the two outer ones were fixed first. A crossbar was then laid over their upper ends. The middle post was lowered until its upper end touched the crossbar. It was held in this position until fixed by filling the hole. The scaffolding was so made that the uppermost crossbar or one of the cross pieces was in the upright line of the main posts. The upper ends of the main posts were lashed to it before the filling of the holes was commenced. The erection took place at about midday. Meanwhile the food had been prepared. The workers and builders retired to their respective parties and the *fa'atunga* ceremony took place.

Owing to the short length of ridgepole to be supported, it is not necessary to have the support at each end as in the *to suuu'i* buildings. One strong, massive post (fig. 13*a*) is quite common. In quite a small guest house, the single post was 46 inches in circumference near the ground. Some are forked *(manga lua)* with the branching close to the ridgepole (fig. 13*b*). A very

large post of this type seen at Taputimu in Tutuila was 56 inches in circumference at the floor level. Others branch lower down (fig. 13*c*), while in Savaii a very low branching fork (fig. 13*d*) was quite common. Some houses have two main posts but three (fig. 13*e*) was as common as the single post. More than three posts were said to be used on occasion. The main posts are sometimes referred to as *to'o loto* (interior prop.)

FIGURE 13.—Types of supporting posts of round house: *a*, single, massive post; *b*, forked type (*manga lua*); *c*, type branching lower down; *d*, very low branching fork; *e*, type with three main posts.

Of the three posts in Misa's house, the middle one was 48 inches in circumference near the ground and the other two, 37.5 and 33 inches respectively. They were placed 20 inches and 19 inches apart so that the ground distance covered by the three posts was 6 feet, 6.5 inches. Thus there was less than a foot of the ridgepole projecting at either end. The posts were 25 feet, 2.5 inches above the ground. The house site was an old one in which the house platform was already complete. In a new house site, the depth of the platform to be erected has to be added to the height of the main posts above the ground level. In the large round house at Iva, the main posts were 32 feet above the floor level which in turn was 6.5 feet above ground level. The main posts, including the parts sunk in the ground, must therefore have been over 40 feet in length.

ITU MIDDLE SECTION

Principal ridgepole. After the feast the ridgepole (*'au'au*) was carried up the scaffolding by one of the carpenters on his shoulder. It was a worked piece of timber, 8 feet, 4 inches in length, adzed to form five surfaces: a wide under surface, two narrow side surfaces, and two wider, upward sloping surfaces that met in a mesial longitudinal edge. It was placed in position on the upper ends of the main posts by the second in command of the carpenters, who all wore *lavalava* waist cloths and who had limed their hair for the occasion. The head builder (*latu*), who was distinguished by carrying a coconut wood walking stick (*to'oto'o*), viewed the ridgepole from the ground about 10 yards away. He called a command. The ridgepole was lifted off, and one of the outer posts was chipped with an adz to lower its level. The ridgepole was again put on and adjusted so that the ends projected evenly beyond the outer posts. A wave of the walking stick expressed approval. Coconut husk fiber (*pulu*) was pushed into the spaces where the surfaces did not quite coincide.

The under surface of the ridgepole was 5 inches wide, a little wider than the upper end of the middle largest post. The ridgepole was lashed to the upper end of each main post with an ornamental yet firm binding termed *le sumu o le 'au'au*. The method of lashing shown in figure 14, is better described with each figure in order. The object is to form the turns in such a manner that the large lozenge motive in it will show toward the front of the house. With the worker facing this aspect of the post, we may refer to the front, back, and right and left sides of the post. Sennit braid with its roughness clings better to the rounded wooden surfaces than smooth cord. It may be necessary, however, for an assistant to hold the commencing loop in position until the figure develops. The outer long stretches of sennit forming the lower borders of the large front and back lozenges are tightened by the shorter inner turns which cross them to form the upper borders of the lozenge.

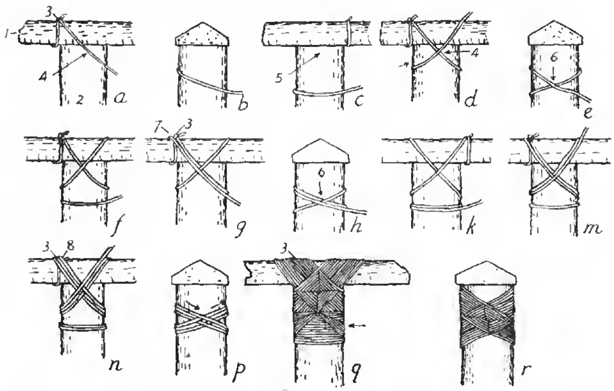


FIGURE 14.—Lashing of ridgepole to main post (*le sumu o le 'au'au*): *a*, the sennit braid is passed round the ridgepole (1) on the left side of the main post (2) fixed with the running noose commencement (3) and the expert deciding on the point indicated by the arrow (4) what point in the middle vertical line of the post shall form the center of the lozenge, brings the braid obliquely downwards over that point and continues in the same line toward the right side; *b*, the braid continues across the right side of the post downwards and towards the right as it passes to the back of the post; *c*, the worker works around the post from its right and continues the braid transversely across the posterior surface of the post, the point on which (represented by the arrow head 5) is one that corresponds to that indicated on the front; *d*, the braid coming from the left side after crossing the back inclines upward around the left side, and emerging on the front of the post crosses obliquely upwards and to the right over the middle front (4) described in (*a*). The braid having made a loop at the back and a diagonal crossing in front, passes transversely back over the ridgepole and descends obliquely downward, to the left over the point indicated by the arrow (5) in (*c*); *e*, coming around from the left, it crosses the left side obliquely downwards to the right, and in doing so crosses the previous turn at a middle point (6); *f*, coming around from the left side, the braid crosses the front transversely to the right. It then ascends obliquely upwards on the right side and, continuing upwards on the back, crosses the back midpoint, the previous turn on its way to the upper surface of the ridgepole on the left; thus completing a turn with a transverse loop in front and a diagonal crossing turn behind to form the complement of the first turn completed in (*d*); *g*, the braid appears in front over the left part

of the ridgepole (7) which is the original starting point (3) in (*a*), and the principle of the technique can now be laid down. Complete turns back to the left or right of the starting point (3) will follow the previous turns throughout their course but alternately below and above the original turn. Below in an oblique turn, means, to the outside from the middle vertical line. All changes of position from below and above or outer and inner take place on the ridgepole. If the principle is followed, the complicated-looking design in (*q*) will automatically form itself. Continuing with figure (*g*), the braid at (7) passes to the outer side of (3) and follows the previous turn closely on its outer or lower side; *h*, continuing the same course on the right side of the post the braid crosses below the lateral midpoint (6); *k*, on the posterior surface it continues the course on the under side of the previous turn; *m*, passing around the left side of the post in the same relationship it emerges around the left side of the front surface and continues the same relationship up onto the ridgepole—a diagonal crossing has been completed below the front midpoint; *n*, in this figure the braid, after getting back to the starting point (3) had completed a turn on the outer and lower side, and the braid was to the outer side of the previous turn. Following the principle laid down, it crossed the starting point (3) to its inner side (8), followed the previous turns in that relationship, and returning to the right side of the ridgepole completed a diagonal crossing above the front middle point, carrying on in the same position to make the posterior crossing above the middle back and completing the turn near the starting point. *p*, This shows the right side of the post after the third complete turn is made. It shows an advance on (*h*) in that a diagonal crossing has been made above the lateral midpoint as well as below. *q*, There is nothing new to add in regard to the turns. By completing each turn to the inner and outer side of the starting point (3) the whole lashing develops. Remember that the transverse turns in front, below the large lozenge, are the transverse turns forward while making the diagonal crossings at the back, and that an exactly similar figure has formed at the back. The transverse turns commenced at the middle of the series indicated by the arrow. Subsequent turns were made alternately above and below the middle. Thus, while the lower margin of the transverse band grew downwards where there was no limitation, the upper margin grew upwards to meet the descending lower corner of the expanding lozenge. When the two meet, the perfect figure is formed, as in (*q*). If the turns are continued the lower point of the lozenge will be gradually covered and the figure spoiled as a figure, though the lashing as a lashing may not be. *r*, The crossings on either side of the post have automatically formed a lozenge of the form shown. Though unintentionally slightly askew it resembles more closely the actual figure in practice, for even the experts do not get them mathematically exact.

The *sumu o le 'au'au* lashing, besides being decorative, is quite effective as a lashing. No steps are taken to fit the post and ridgepole by mortising in any way. The flat under surface of the ridgepole simply rests on the flat upper end of the main posts.

Principal rafters. The principal rafters (*fatunga*) are always made of coconut wood (*niu*). Trees are felled for the purpose and adzed into very long battens 4 inches wide and 1.5 in thickness. The straight stem of the coconut provides the length required and the flexibility to form a curve for the roof. They are made longer than necessary. The lower extra part is but roughly shaped and is kept for fear an error of judgment as to length. They are cut off when the thatch rafters are trimmed. The upper ends are dealt with in pairs. (See fig. 15.) The inner surface is quite flat, but the outer surface is generally convex, being 1.5 inches thick in the middle line and 1 inch at the edges.

The flat under surfaces of the rafters lie against the slanting upper surfaces of the ridgepole. While the upper ends are being fitted (fig. 16) assistants support the weight. Two long poles are used. (See fig. 18*a*, 2.) A pair is placed over each end of the ridgepole, and a pair or two pairs close together over the middle.

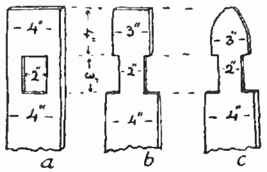


Fig. 15

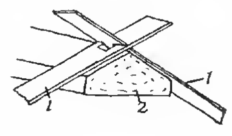


Fig. 16

FIGURE 15. Shaping the upper ends of rafters; *a*, the first member of the pair with a rectangular hole chiselled through about 4 inches from the end. *b*, the second rafter with a square end, has the sides shaped to fit the hole in *a*. *c*, a second rafter with the end rounded for easier insertion through the hole. The end of the second rafter is turned sideways, passed through the hole of its pair and turned back to the flat when the ends of the pair are locked in position.

FIGURE 16.—Fitting of upper ends of rafters: 1, rafters; 2, ridgepole.

In the canoe shed, the curved poles were termed *iviivi*, and in the cooking and dwelling houses, the straight rigid rafters were termed *matua* and *la'au fange'a* respectively. The flexible coconut rafter is termed *fatunga* whether in guest or dwelling house.

The rafter pairs are lashed to the ridgepole where they cross and the lashing (*fausanga*) is so arranged that a neat lozenge pattern is worked on the under surface of the ridgepole. The lashing consists of transverse turns and diagonal turns round each element of the woodwork. The turns form the complement of the other. As a principle, it may be laid down that transverse turns round one wooden element demand a diagonal turn round the other and vice versa. The object is to form a rectangular space on the under surface of the ridgepole with two sets of transverse turns and then finish with diagonals within the space neatly crossed to form a lozenge. The builder keeps this in mind primarily, and the lashing of the woodwork together goes on incidentally. (See fig. 17.)

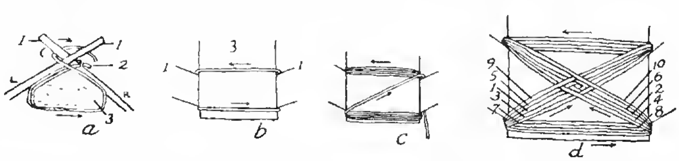


FIGURE 17.—Lashing of rafters to ridgepole: *a*, the sennit working hank is first fixed to one of the rafters (1) just below the rafter junction at (2), with the usual slip knot shown in the scaffolding. The free end of the sennit is passed around the right rafter, tied over its standing part with an overhand knot, and drawn taut. The braid is drawn tightly to the left around the ridgepole (3) to the right with a transverse turn across the under surface near the end edge and brought up on the right over the ridgepole, keeping close to its edge. It crosses its starting point and passes backward over the left rafter in the fork formed by the upper end of the right rafter. From here the braid crosses over the top of the ridgepole to reach the lower surface on the far side of the right rafter.

b, It makes a transverse turn to the left to the far edge of the left rafter, which shows the rectangular space on the under surface of the ridgepole thus defined. The braid passes upwards over the ridgepole and crosses the right rafter in the right fork formed with the upper end of the left rafter. When it reappears at the near edge of the right rafter, it is back to its original starting place. *c*, The movements are repeated until there are two sets of four transverse turns on the under surface of the ridgepole. The braid is brought back to the point where it would make a fifth near transverse turn but instead of doing so it makes a diagonal turn to the far edge of the right rafter. *d*, from there it makes transverse turn over the right rafter, and appearing on its near side, it makes a diagonal turn across the under surface of the ridgepole to the far edge of the left rafter. A transverse turn over the left rafter brings it to the near edge where it started the diagonal turns. The crossing of the two first diagonal turns forms the center of the lozenge. All diagonal turns must now follow a regular sequence, first on the near side, and then on the far side of the first crossing turns from either side. Five turns form the complete lozenge. The figures at the sides show the order in which the turns were made. All lozenges are formed in this way, and if the turns are laid closely to the outer side of the preceding turns both below and above, the neat lozenge develops itself.

Sueh a figure is termed *mamanu*. The guild of builders invited me up on the seaffolding to wateh the ornamental lashings being done. The braid is fixed by taking a eouple of half hitehes round one of the turns on the baek of a rafter.

The talava. These are really purlins but much smaller than the main purlins and at the same time larger than the intermediate purlins. (See fig. 18*a*, 3.) In eastern Samoa they are ealled *talava*. In western Samoa there is no distinetion in size from the intermediate purlin, but its position is specified by terming it *solinga*. No eollar beam is attaehed to the *talava*.

Wall plates. The wall plates *(amo pou)* are eut out of solid breadfruit wood and shaped round in section with a diameter of 5 or 6 inehes. They are cut to the same length as the ridgepole, that is, about 8 feet, 4 inehes. One was lashed temporarily to the under surfaee of the rafters at a height from the ground judged by the head builder. The lashing was the same as in the seaffolding, but a separate working hank was used on eaeh end rafter (fig. 18*c*) of the same side and left hanging. A long pieee of sennit was then stretehed along a rafter from the *talava* above to the wall plate below, and a knot tied to mark the distanee. The wall plate was then eheeked off with the measured braid on each rafter of the same side, and the wall plate properly adjusted. The distanees from the opposite *talava* were marked off on the two end rafters of that side with a pieee of ehareoal. The other wall plate was then temporarily lashed in position. (See fig. 18*a*, 4.)

Note from figure 16 that the rafters are hung over the ridgepole where the loeking of the upper ends, and the lashing, keep them in position. The weight is partly taken by the temporary struts which keep them out at an angle eomplying with the upper inclined surfaees of the ridgepole. The wall plates are attached and merely hung on the rafters without any support from below.

The wall plate is called *amopou* as there is no main plate to deprive it of its proper name. Pratt (23, p. 162) gives the alternative name of *langolango*.

Principal purlins. The principal purlins (*amoamo*, or *la'au matua*) must be evenly spaced along the rafters between the *talava* and the wall plate. The number was fixed by the *taufale* when he told the head builder the number of *so'a* (collar beams) he desired. In the round house there are no tie beam purlins as in the long house. Each opposite pair of main purlins must have a *so'a* collar beam between them with the exception of the lowest. Thus Misa had decided on 7 *so'a*, so the space between the *talava* and wall plate had to be evenly divided for 8 purlins. The lowest free purlin is called *amoamo tannoa* (inactive purlin). In western Samoa it is called *la'au tauvale, la'au taunoa,* and *la'au sautia. Tauvale,* like *taunoa,* carries the meaning of "inactive." The term *sautia* (bedewed), conveys the metaphorical idea of being open to the dew through not being covered by collar beam attachments. It is also called *luanga.* The height of the main posts above ground is thus considered by the

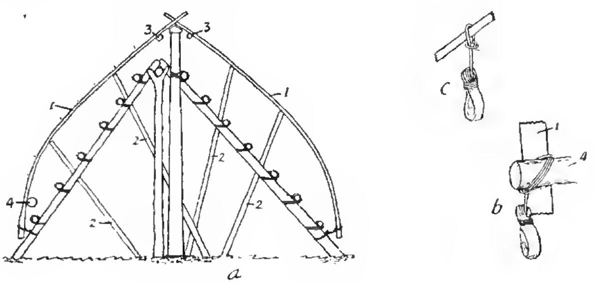


FIGURE 18.—Rafters in position and temporary lashings: *a,* left rafter showing points marked off where 8 pieces of bark touch: 1, rafter; 2, temporary struts (*te'e*) of two long poles on either side to relieve weight on rafter join and maintain approximate position; 3, two horizontal battens (*talava*) about 2 inches wide and 1 inch thick, tied to the under surface of rafters about 10 inches from either side of ridgepole; 4, wall plate in position on rafter; *b,* temporary lashing, working hank slipped through circumferential turn to hold lashing and left hanging for later permanent lashing: 1, rafter; 4, wall plate; *c,* working hank tied with running noose to a marked spot on rafter.

head builder from the point of view of the number of *so'a* collar beams and their corresponding purlins, as the purlins must not be placed too closely together. The purlins are adzed out of breadfruit wood in the same manner as the wall plates. They also are the same length as the ridgepole and decrease in diameter from below upwards, the lowest being smaller than the wall plates.

An assistant brought the measured sennit to the head builder. Holding one end in his left hand, the builder made a turn round one of the assistant's upheld hands and back to his own. He made four such turns, and handed the other end to the assistant. By working their hands they adjusted the loops to an even length with the ends of the cords at either end of the loop. Each had thus the doubled ends of four turns, which they marked by inserting strips of *fau* bark under one of the strands of the sennit braid. On finishing, the head builder carelessly tossed the marked braid back to the assistant.

It had 8 pieces of bark evenly spaced in the length that corresponded to the distance between the *talava* and the wall plate. The head builder had no pencil or paper, and he did not know the length of the cord in feet and inches. He and his guild had never needed anything beyond sennit braid and *fau* bark in making calculations.

The assistant returned to the building, and tossed up the end of the cord to a carpenter on the scaffolding. The two ends were held against the *talava* and wall plate while a third carpenter, with a piece of charcoal, marked off against the rafter the points where the eight pieces of bark touched. (See fig. 18*a*.) This was repeated on the other end rafter of the same side. Another carpenter tied the free end of a working hank with the slip knot fixation round the rafter at each mark (fig. 18*c*) and left eight hanks hanging in the air. Other carpenters, in pairs, tied the appropriate purlins to the under side of the end rafters with temporary lashings at the positions where the hanging hanks were waiting for them. A few diagonal turns were made with the sennit already tied to the rafters. A circumferential turn was taken round the lashing between the rafter and purlin. (See fig. 18*b*.) In an incredibly short time the 8 purlins were attached to the end rafters on either side. The builders then adjourned as the villagers had gathered for the *fuiava* to complete the *fa'atunga* ceremony.

Work commenced the next morning with bending the rafters into the right curve. The head builder, with his wand of office, took up a position about ten yards away from the end of the framework. The second in command executed his orders regarding the frame from the scaffolding, and directed those below with the struts. The head builder called to lift up the rafter at the first purlin. This was done by a carpenter getting his shoulder under it and straightening his back. The second in command placed the end of a long strut under the rafter, and directed the strut bearer as to the placing of the lower end on the ground. When the weight was released, if the strut proved satisfactory, the head builder waved his walking stick in approval. In this way, 5 struts were placed commencing with a longest strut. (See fig. 19*a*.) The lower ends were pushed outwards toward the rafter until taut. If too long, they were shortened with an adz stroke. I stood behind the head builder as he issued his orders. He judged entirely by eye, and left nothing to be desired. In this way the long rafter was bent to the right curve as shown in the figure. Its lower end was, of course, still fixed by the tie to the scaffolding, but it was readjusted to suit the curve.

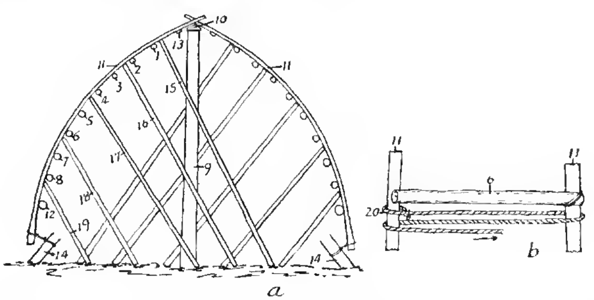


FIGURE 19.—Permanent curve of rafters and adjustment; *a*, struts shaping permanent curve of rafters: 1-8, purlins; 9, supporting post; 10, ridgepole; 11, rafters; 12, wall plate; 13, horizontal batten (*talava*); 14, lower end of scaffolding; 15-19, five struts propping up left rafter, similar on other side; *b*, adjustment of warped rafter to width of purlin by bracing with rope: 6, purlin; 11, rafter; 20, rope tied to rafter.

The struts (fig. 19*a*, 15-19) were fairly slender poles. There were not let into the ground or tied above. They looked flimsy and liable to slip, but both struts and rafter remained in the position assigned them. Now and again a purlin dropped out of the temporary lashings owning to the movement of the rafter, but they were quickly lashed on again. The first set of two temporary struts was readjusted and included in the five.

The opposite end rafter was dealt with similarly to correspond in curve with its pair. The head builder then changed position to the opposite end of the house, and a corresponding curve was made with the other end rafters. The rafters over the middle of the ridgepole needed no adjustment as they rested on the purlins which followed the curve of the end rafters. The two sides were checked by running a line from the base of the middle main post to the middle of the wall plate and comparing with the measurement of the opposite side. The first measurement indicated a difference of only 2 inches, showing how keen was the eye of the head builder.

Theoretically, the outer ends of the purlins correspond exactly with the outer edges of the end rafters, but in practice some do not, owing to the warping of the rafters. Inward warping does not matter, but outward warping must be corrected to bring the outer edges of the rafters into line with the purlin ends to enable a lashing to be made. In figure 19*b*, the left of the two rafters projects beyond the left end of the purlin. As the purlin has been cut to the right length, the two rafters must be drawn together until the outer edge of the left rafter coincides with the end of the purlin. A rope is tied round the displaced rafter, passed under and over the other rafter, and back

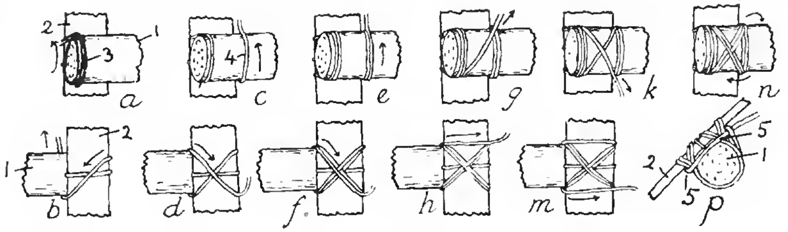


FIGURE 20.—Lashing purlins to principal rafters. 1, purlin; 2, rafter: *a*, the braid is brought up with a transverse turn (3) around the purlin close to its outer edge; *b*, it passes diagonally over the back of the rafter to where its inner edge meets the purlin; *c*, the braid is continued transversely upwards over the inner surface of the purlin to form another transverse turn (4), parallel with the first turn (3) and separated from it by the width of the rafter; *d*, the braid crosses diagonally over the back of the rafter to its outer edge, where it reaches the starting point; *e*, the two previous turns over the purlin are repeated to form two pairs of transverse turns around it; *f*, the diagonal turns over the back of the rafter have also been repeated to get the braid into position; *g*, diagonal turns are now made over the purlin, commencing from the lower outer corner and running upwards to the upper inner corner; *h*, from the upper inner corner, the braid passes transversely across the back of the rafter to its outer edge; *k*, from the upper outer corner, the braid makes a diagonal turn downwards to the lower inner corner, crossing the first diagonal turn in the middle of the space defined by the transverse turns around the purlin; *m*, the braid makes a transverse turn across the back of the rafter to its outer edge where it is in the position (*f*) to repeat the diagonal turns; *n*, two more diagonal turns are made just below the previous ones and these are sufficient for the lashing. After making the last diagonal turn, the braid makes a circumferential turn around the lashing between the purlin and the rafter. *p*, The circumferential lashing (5) is shown in section passing between the two wooden elements and through its own loop which fixes the lashing. Another circumferential turn may be taken. The circumferential turns besides drawing the lashing additionally taut, prevents the outer transverse turns around the outer end of the purlin from slipping over the edge. The remainder of the working hank is usually left hanging to be used later in lashing the thatch rafters to the purlin. All the purlins are similarly lashed to all the rafters including the middle set.

under and over the left rafter. By pulling on the rope end in the direction of the arrow, the two rafters are drawn together. The temporary lashing on the left has been unfastened and when the position has been corrected, a permanent lashing is made before the rope is slacked off.

The temporary lashings are now converted into permanent ones. The simple but neat method is shown (fig. 20) on an end left rafter viewed from the scaffolding on which the carpenter stands. The upper row shows the view from the inner operating side and the lower row, the appearance on the outside. The edge of the rafter corresponding with the end of the purlin is referred to as "outer," and the other edge as "inner." The temporary lashing is unfastened but the cord is left attached by its transverse turn round the rafter. This turn is concealed by the purlin on the inner side but is seen, in the lower figures, crossing the rafter transversely. In smaller round houses with a short middle section, the two pairs of end rafters are sufficient.

Upper ridgepole. The upper ridgepole *('au'au lunga)* is of worked timber slightly larger than the *talava* purlin. It is made longer than the main ridgepole so as to project slightly beyond it at either end. It is rested in the upper forks of the rafters and lashed to them with any combination of transverse and diagonal turns. No careful arrangement is made as the lashings are not seen.

Thatch rafters. The thatch rafters (*'aso*), composed of small rods split from breadfruit wood, are about an inch wide and barely that in thickness with the edges rounded off. Length is obtained by joining the short lengths together.

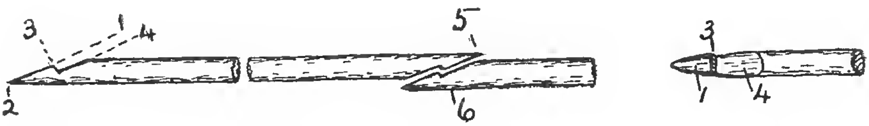


FIGURE 21.—Shape of thatch rafter (*'aso*) join. The long oblique slant (1) is commenced about 3.25 inches from the end of the rafter and run out to a point (2). Two inches from the point (2), a transverse cut (3) is made at right angles to the oblique plane of the slanting surface (1). The upper part of the oblique surface is cut to a lower plane (4) to meet the right-angled cut and forms another surface about 1.25 inches in length. In shaping the other end of the rafter, the point (5) must be on the other side to that first made. The point of another rafter (6) is shown in position for joining. The appearance of the two surfaces (1,4) with the right-angled surface (3) is shown on the right of the figure.

The join (*so'o mata sai*) is made with a long oblique slant as in figure 21 where the plane is broken transversely in the middle to prevent the inclined surfaces from slipping apart. Both ends of the rods are shaped by the older carpenters in the *fale ta* shed to the standard plan indicated by the dimensions in the legend of figure 21. It is immaterial which way they face or which end is above, as the fitting is the same.

The shaped lengths are joined together outside the shed. The lashing *(fafau so'o 'aso)* is quickly made (fig. 22) with sennit braid, and no material is wasted. Usually one lashing over the middle is sufficient, but sometimes two, slightly apart, are used.

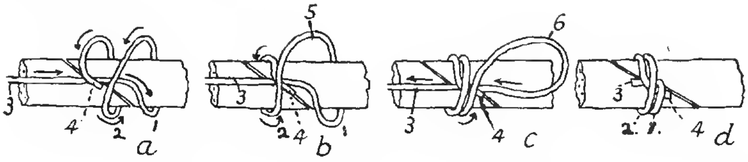


FIGURE 22.—Lashing of thatch rafter join *(fafau so'o'aso)*: *a,* two rod ends are fitted and held together by the left hand. The braid (3) is passed longitudinally under the left thumb which is midway along the joint. The end, with sufficient length to form two loose turns round the joint, is passed downwards on the near side of the rod to form the loose turn (1), brought around again in the second turn (2) and its end (4) brought over to cross the standing part as shown in the figure. The left thumb keeps the end (4) and the standing part of (3) firmly in position by pressure against the wood. *b,* The near loop (2) is drawn taut by the right hand, and brought vertically up over the crossing where it is fixed by the left thumb. *c,* The far loop (1) is drawn taut by seizing the part (5) in *b* from beneath the rod and drawing it tightly around close to the previous loop. It is drawn upwards over the crossing, and held by the left thumb. The braid slack has now resolved itself into the large loop (6) to the right of the crossings. *d,* The standing braid(3) is now pulled to the left to remove the slack loop (6). The braid is cut off on the left of the crossings, and the join lashing is complete.

The joined thatch rafters *('aso)* are now carried by two men to control the length, and passed upwards on the outside of the purlins. The upper ends are passed between the two ridgepoles to project a couple of inches on the other side. All lashing is done from the inside and commences on the *talava.* The head builder gives the spacing in finger breadths beforehand. In good houses, the space between *'aso* is two finger breadths *(vaelua)*; in others, three or more. In Misa's house, when I called up to the second in command as to the spacing, he held up two fingers. It is not necessary to wait until an upper row is completed before commencing a lower, but the individual *'aso* must be lashed consecutively from above downwards so as to remove any bend or twist in its length. While some carpenters were busy handing up the *'aso* and inserting the upper ends in position, one commenced lashing from the left of the *talava.* He spaced the first by passing two fingers of the left hand between it and the left principal rafter. Taking the hank of sennit hanging from the permanent lashing of the *talava* and the rafter, he lashed the first *'aso.* He spaced the second and carried on the lashing with a continuous braid. After he got a start, a man commenced on the first purlin by carrying on with the hank from its permanent lashing to the rafter. As he progressed to the right, another commenced on the second purlin, and so on right down to the wall plate. Some of the *'aso* were quite crooked, but the consecutive lashing from above down soon straightened them out.

The lashing of the thatch rafters to the purlins is the same throughout. As the crossings over the inner surface of the purlins are plainly viewed from inside the house, utility is combined with decoration by using a vertical pair of turns on either side of the *'aso*. In figure 23 the upper row represents the outer surface, and the lower, the inner appearance on the horizontal purlin.

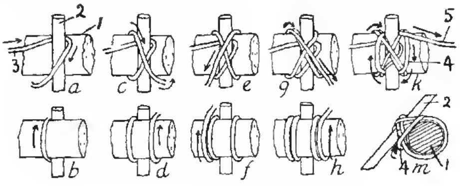


Fig. 23

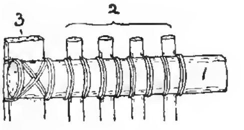


Fig. 24

FIGURE 23.—Lashing of thatch rafter (*'aso*) to purlins. The *'aso* touches the large rounded purlin in the middle line of its long axis, so that "above" and "below" the purlin applies to the parts that touch and not the upper and lower edges of the purlin seen in the figure: 1, purlin; 2, *'aso*: *a*, the braid (3) from the principal rafter lashing on the left (fig. 20) is brought across on the outer surface of the purlin (1) to pass beneath the *'aso* (2), and above the purlin contact to the right of the *'aso* over which it is crossed diagonally downwards to appear on the inner surface of the purlin to the left of the *'aso*. *b*, The braid makes a transverse vertical turn over the inner surface of the purlin; *c*, crosses over the back of the *'aso* diagonally downwards to the right; *d*, and appears on the under side of the purlin and makes a vertical turn upwards on the right of the *'aso*; *e*, at the back, it again crosses the *'aso* diagonally downwards but to the left; *f*, appearing on the purlin to the left of the *'aso*, the braid makes a vertical turn upwards to the outer side of the first turn (*b*); *g*, it crosses the *'aso* diagonally downwards to the right; *h*, appearing on the purlin, the braid makes a second vertical turn upwards to the outer side of the previous turn on the right. This completes the set of two vertical pairs of turns on the inner surface of the purlin. *k*, The lashing is finished off with a circumferential turn (4) round the lashings between the *'aso* and the purlin and the braid (5) passes on to the next *'aso* to repeat the technique described. *m*, A section through the purlin (1) shows the circumferential turn (4) passing between the purlin and the *'aso* (2).

FIGURE 24.—Completed lashing of thatch rafters to purlins. 1, purlin; 2, thatch rafters; 3, principal rafter.

The parallel pairs, commencing from the principal rafter on the left are shown in figure 24. They give a pleasing effect in the guest houses. Threes are sometimes used if the *taufale* has plenty of sennit braid. The *'aso* are parallel throughout their course from ridgepole to wall plate. An unorthodox form of decoration seen in Tutuila consisted of obliquely directed *'aso* between the wall plate and the second purlin above it. The closely set thatch rafters with the lashing to all crossing elements, while contributing largely to the stability of the roof, have been to the interest of the builders' guild in promoting decorative effect and increasing their scope of work. It is only every seventh thatch rafter or so that is actually used for the attachment of the thatch.

In Asau, Savaii, the *'aso* are formed of long fine rods of the *alamea* which need no joining and no shaping beyond removal of the bark. They are pleasingly white, but if soaked in sea water to facilitate peeling they turn to a less effective dull-brown color.

Used *'aso* from a dismantled house are darkened by age. A decorative effect in stripes, termed *pulei*, is obtained by alternating them with new *'aso*.

Intermediate purlins. Horizontal purlins, the same size or a little larger than *'aso*, are spaced between the *talava*, purlins, and wall plates. Two intermediate purlins (*luanga*, or *pae'aso*) divide each of these spaces into three while the lowest space between the free purlin and the wall plate usually has three intermediates. They are laid in position on the inner surface of the rafters and *'aso*, with their ends flush with the outer edges of the end rafters. A couple of temporary lashings hold them in position while the permanent lashings are made.

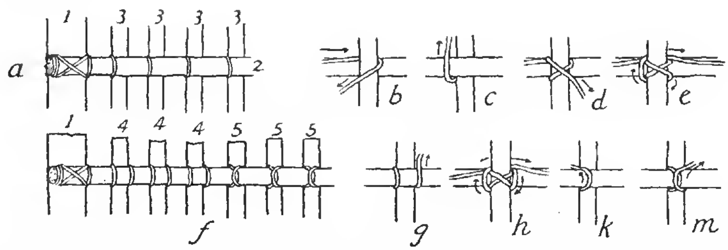


FIGURE 25.—Lashing of intermediate purlins to rafters: *a*, single lashing turns with principal and thatch rafters: 1, principal rafter; 2, intermediate purlin; 3, thatch rafters —the working hank is attached to the left principal rafter (1) with a running noose. Transverse turns are made around the purlin (2) on the left and right edges of the rafter followed by two single diagonal crossing turns and finished off with a circumferential turn between the rafter and the purlin. The purlin having been lashed to the principal rafter, the braid goes on to the right to deal with the thatch rafters successively by single turns around the purlin on the left side of the thatch rafters; *b*, the braid coming from the rafter on the left along the back of the purlin passes under the thatch rafter and crosses over downwards to the left; *c*, front of the purlin on which the braid passes upwards on the left side of the rafter to make a single transverse turn around the purlin; *d*, back of the purlin where the braid appearing over the upper edge of the purlin on the left, crosses diagonally over the back of the rafter downwards to the right; *e*, continuation of back view in which the braid from the right lower corner makes a circumferential turn between the purlin and the rafter and goes on to the right to continue the lashing with the next thatch rafter. A closer lashing may be made by making two single turns around the purlin with each thatch rafter (*f*, 4). Instead of making a circumferential turn after the lashing has reached the stage (*d*), the braid from the right lower corner makes a transverse turn around the purlin on the right side of the rafter as in (*g*). The circumferential turn is then made and the braid passes on to the right as in (*h*) which shows the back view. A variation of the two single turns is shown (*f*, 5). Instead of the first turn around the purlin being straight (*c*) the braid is curved inwards past the middle vertical line of the rafter as in (*k*). The curve is maintained by pressure of the left thumb against the purlin. The second transverse turn around the purlin is curved to cross the first, as in (*m*), when it effectively holds the first curve in position and will not slip itself as it rests against the rough surface of the sennit of the first curve.

Before the stage of tying on the intermediate purlins was reached in Misa's house, I had to move on reluctantly. Fortunately, however, at the next island of Olosenga, a house in course of erection enabled me to follow the steps. Commencing on the left end rafter (fig. 25) a working hank was tied round it in the usual way. The lashing was similar to that of the main purlins except that, owing to the smaller size, single turns were used instead of two.

The intermediate purlins are usually in one piece for the short length of the middle section, but if a join is required, the *so'o mata sai* of the thatch rafters is used. Every intermediate purlin is tied to every principal and thatch rafter that crosses it. This adds to the firmness of the rafters, but they are again an introduction by the builders to add decorative effect by breaking the wider spaces between the main purlins, and to demonstrate their craftsmanship. In eastern Samoa the intermediate purlins are called *luanga,* but western Samoa applies this term to the lowest free purlin, and rightly maintains that *pae'aso* (rest for the *'aso*) is a better name for the intermediates.

The eave batten. While the intermediate purlins are being lashed, the eave batten (*langolau,* or *niufafo*) is put on. It occupies the same position as in the humbler houses, but is dubbed out of coconut wood into a batten. (See fig. 26.) The lashing is shown in figure 27.

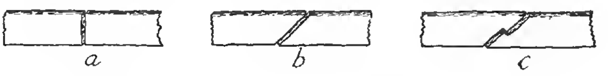


FIGURE 26.—Contact joins of eave batten (*langolau*) : *a,* set on edge, 3 inches wide by 1 inch thick—short pieces joined merely by contact of squared ends; *b,* oblique slant join; *c, so'o mata sai* join. At the slanted contacts the lashing from the thatch rafters passes over both elements but there is no special lashing to attach two individual pieces of the eave batten to each other.

Some carpenters notch the free edge of the batten. When the lashing is completed the principal rafters and *'aso* are cut off close to the lower side of the eave batten. The circumferential turns prevent the turns round the *'aso* from slipping over the cut ends as shown in figure 27 *n*. Though the 3 inch wide batten is set on edge, the form of lashing effectively keeps it in position.

The rafters are taken in their turn with the same lashing as the *'aso.* In eastern Samoa the eave batten is called *langolau,* but western Samoa applies that term to the first sheets of thatch laid above the batten, and, for the batten itself, uses the name *niufafo.* The batten is made of coconut (*niu*) and it is placed outside (*fafo*).

The collar beams (*so'a*). These are transverse beams set between opposite pairs of purlins to keep the rafters in a fixed position. They are here termed

collar beams from their occupying a somewhat similar position to collar beams in architecture. In architecture, however, the collar beam acts as a tie to keep the rafters from spreading out laterally owing to the weight of the ridgepole. In the Samoan house, the ridgepole is supported directly by solid main posts and there can be no lateral spread from a downward thrust of the ridgepole. There is, however, a lateral thrust which has been purposely introduced by pushing out the principal rafters with temporary struts as shown in figure 19 *a*. If the temporary struts are removed, the sides of the roof will come inwards of their own weight. The position of the struts was therefore changed by using permanent horizontal ones between the opposing sides.

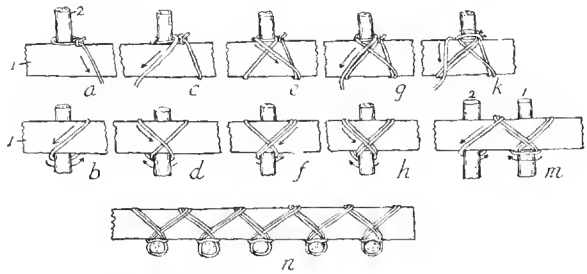


FIGURE 27.—Lashing of eave batten to thatch rafters. The worker stands outside the house. The upper row of figures shows the upper wide surface of the batten (1) as the worker would see it as he bends over the top and looks down on it. The lower row shows the lower wide surface of the batten as the worker faces it. The lashing works from right to left along the *'aso* (thatch rafters) (2). *a,* The end of the sennit hank is passed round the end *'aso* above the batten, and tied to it with the slip knot commencement. The braid is carried obliquely to the right over the free edge of the batten. *b,* On the under side, it descends obliquely over the *'aso,* and passes round the *'aso* from its left side, under, and to its right side on the other side of the batten; *c,* from the right side of the *'aso,* it passes obliquely to the left on the upper surface of the batten to cross its free edge a little to the left of the mid-point to the next *'aso* on the left; *d,* descending obliquely on the under surface of the batten, it passes over the *'aso,* around its right side, and under to the left side on the other side of the batten; *e,* from the left of the *'aso* it passes obliquely to the right to cross a free edge on the right of the first turn; *f,* descending obliquely on the under surface, it passes over the left side of the *'aso* and under it to the right on the other side of the batten; *g,* from the right of the *'aso,* it runs obliquely to the left to cross the batten free edge on the left of the previous left turn; *h,* descending obliquely to the right over the *'aso,* it passes around its right side and under it to the left on the other side of the batten; *k,* from the left of the *'aso* the braid passes transversely over the *'aso* and makes a circumferential turn around the lashings between the *'aso* and the edge of the batten. The braid then passes vertically to the free edge which it crosses on the right of the two previous turns. *m,* The other part of the circumferential turn is shown by the arrow on *'aso* (1). From the free edge of the batten, the braid now passes obliquely down to the left, over and around the left side of the next *'aso* (2) and under it to its right side on the other side of the batten. This, however, is the same stage as shown in (*b*). From now on the lashing of the second *'aso* is a repetition of the movements with the first. Each *'aso* is thus bound with two turns to either side of the free edge of the batten. *n,* The crossing of the turns at that edge are to prevent their slipping.

The beams are adzed out of breadfruit timber and decrease in diameter from below upwards, with their corresponding purlins. The lengths, which also decease upwards, are taken by stretching sennit braid between opposite pairs of purlins and cutting the beams in the shed to the measured lengths. They are cut slightly longer and fitted with an adz after trying them in position. The beams are placed so that they rest against the main posts to which they are also lashed. With one main post, there is a collar beam on either side of it in the lower tiers and only one in the upper tiers. With three main posts, there must be a collar beam on the outer side of the outer posts in all the tiers. In the lower tiers there is also a beam on either side of the middle post, but in the upper tiers only one is used and whichever side of the middle post it is on is usually maintained throughout. Each opposite pair of purlins must have collar beams, except the lowest.

The collar beams are temporarily suspended as in figure 28 *a,* where one is hung in position by a cord to a thatch rafter above. A collar beam may also be directly lashed to convenient parts of the scaffolding. Any parts of the scaffolding that obstruct the line of the collar beam are removed.

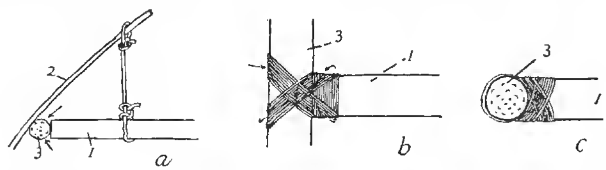


FIGURE 28.—Lashing of collar beams to main purlins: 1, collar beams; 2, thatch rafter; 3, purlin: *a*, collar beam in position against purlin. The ends of the beam are not cut concave to fit exactly against the purlin but are left square as brought from the carpenters' shed. The spaces above and below the point of contact, as shown by the arrows, are filled in with coconut husk fibre to give the ornamental lashing an even surface to lie on. *b,* Completed lashing (*le sumu o le so'a*) as viewed from below. The technical details may be followed in the ridgepole lashing (fig. 14). Here the purlin corresponds to the ridgepole and the collar beam to the main post. Owing to the wider surface of the purlin, the main lozenge figure is worked on it whereas, in the other, it is worked on the wider surface of the main post. The sennit is fixed to the purlin with the usual slip knot and the arrows in the figure show the direction of the first course of the braid. The craftsman has complete control of his work from his position on the scaffolding. He sees to it that the first crossing is in the correct position on the under surface of the purlin and that the second crossing is in a corresponding position on the opposite upper surface. By following the ridgepole technique, the figure shown develops automatically. The lozenge motive is formed on both the lower and upper surfaces of the purlin and extends outwards on the part filled in with coconut husk. The upper figure though not seen from below is necessary for the even development of the lashing. *c,* Side view not seen from below. A collar of lashing has been made around the beam, holding quite well, but the weight is also carried by the direct lashings to the main post.

The lashing of the collar beam to the purlin is ornamental as well as structural. The form of lashing (*sumu*) in this position is termed *le sumu o le so'a* (the lashing of the collar beam) to distinguish it from *le sumu o le 'au'au* (the lashing of the ridgepole). The distinction is one of position only,

as the technique of the two lashings is identical in detail. The carpenters regard these two lashings as the highest development of house lashing. (See figure 28.)

Lashing collar beams to main posts. When both ends of the collar beams are lashed, they are lashed at their middle to the main posts. The lashings of the single collar beams to the outer side of the outer main posts are shown in figures 29 and 30.

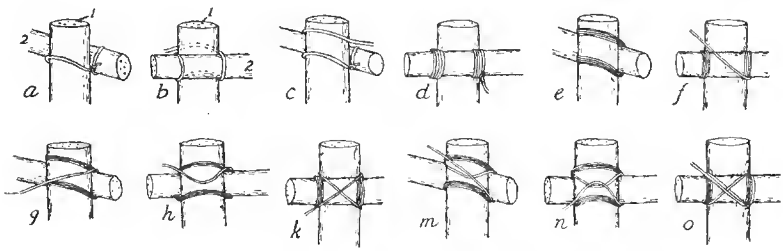


FIGURE 29.—Lashing of collar beam to main post: 1, main supporting post; 2, collar beam; *a*, the braid end is fixed with the slip knot commencement around the collar beam, and the braid makes a transverse turn around the back of the post from right to left. The turn is not exactly horizontal with the lower edge of the collar beam, but is arched above that level. *b*, The braid appears below the beam in front and turns directly upwards over it to the back; *c*, it repeats a higher transverse turn around the post at the back at a higher level from left to right when it passes forward above the beam; *d*, passing downwards around the beam it comes to the back of the post to repeat the turn in (*a*). The turns are repeated in the order above until there are 2 sets of 4 transverse turns around the collar beam; *c*, there are also 2 sets of transverse turns around the post. The higher level of these turns must be observed. This counteracts sagging. The rough sennit does not slip on wood so readily as a smooth cord. *f*, Diagonal turns are now used. The braid is brought up from the right lower corner diagonally across the outer surface of the collar beam to the left upper corner where it passes back behind the post. *g*, Behind the post, the braid forms a curve by being directed downwards to the middle line to just below midway between the sets of turns; *h*, it is then curved upwards to complete the curve, and goes forward above the beam; *k*, appearing at the right upper corner, it crosses the tie beam diagonally to the left lower corner, where it passes back around the post; *m*, appearing from below the beam, it forms a lower curve by passing obliquely upwards on the back of the post to cross the upper curve; *n*, it turns downward to complete the curve by passing forward under the collar beam. The middle of the lower curved loop has crossed the middle of the upper loop. It fixes it down and counteracts any tendency for the upper loop to slip upwards, and, at the same time, gets a better grip on the rough material of the loop beneath. This is a common practice in Samoan technique. All loops and turns are tightly and firmly applied with the right hand while the left thumb presses the end of the turn against the woodwork when the pull is finished. *o*, The braid appears in the right lower corner beneath the beam, and makes a diagonal turn upwards across the beam. This is position (*f*). The turns are repeated to make 4 in each diagonal over the beam, and in each loop over the back of the post. After the first diagonal turns, the others are made alternately above and below the first.

The circumferential turns which complete the lashing enables the whole to be braced together and tightened securely. The roundness of the two wooden elements prevent the circumferential turns from being seen directly

from the front or back. The end is fixed with a couple of half hitches around one of the previous turns, or by tying an overhand knot around one of them.

Less care is devoted to the lashings of the upper collar beams as their decorative feature can not be seen so readily from below. The lozenge motive was usually omitted and the three distinct bands on the back (fig. 30 *b*, and *c*) were usually merged together into one broad band. The guild of builders were thus inclined to do slovenly work where it could not be observed.

The single main post or the middle post of three has a beam on either side of it. All three elements are lashed together at the same time. A running noose is made around the post. About eight transverse turns are taken around both collar beams on either side of the post. Diagonal turns are then made across the outer surface of both beams, the sennit passing across from one beam to the other around the sides of the posts as in the case of the transverse turns. They are done in sequence so as to develop the lozenge pattern on the outer sides of the beams and on the sides of the post as in figure 31.

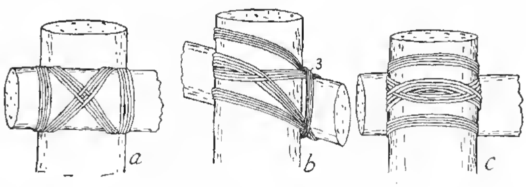


Fig. 30

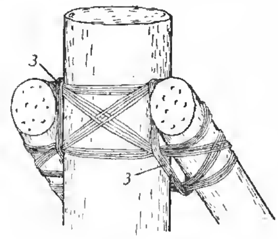


Fig. 31

FIGURE 30.—Completed lashing of collar beam to main post: *a*, front view of completed lashing on outer surface of collar beam where the diagonal crossings form the lozenge *mamanu*; *b*, side view, the lashing is tightened up and finished off with a number of circumferential turns (3) passing around the outside of the previous lashing turns and between the post and collar beams; *c*, overlapping curved loops at back of the post, each succeeding loop is to the outer side of its preceding one.

FIGURE 31.—Lashing of 2 collar beams to middle main post. The lashing is tightened up and finished off with a number of circumferential turns (3) on either side of the post.

A cross section of the roof frame, with collar beams in position, gives the appearance in figure 32. Looking upwards from the floor, the perspective of decreasing collar beams gives a fine appearance to the eye, and also conveys a false impression of height. Tufele's house with five tiers was 20 feet high; Misa's with seven was 25 feet, 4 inches, and the Iva house with thirteen tiers was 32 feet.

The number of tiers not only indicates the size of the house, but also the status of the owner. There is also a variation in different villages which may have been influenced by financial considerations. The collective term for the tiers is *tauso'anga* to which the number is added. Thus Misa's house was *tauso'anga fitu* (seven tiers of collar beams).

The pair of longitudinal beams (*te'e tala*) described by Handy (14, p. 13) in a round house at Mulinuu near Apia, running on either side of the central main posts at right angles to the collar beams and lashed at both ends to the *fau tu* (middle arch) of the rounded ends, is unusual. I saw it nowhere else in British or American Samoa. Its name, *te'e tala*, means a support for the rounded ends. The glory of achievement of the Samoan builders is that they erected the rounded ends with arches unsupported by beams or principal rafters. The longitudinal strut seems foreign to their genius. As the building was constructed for the Government, the abnormal beam, composed of what looks like sawn Oregon pine, makes it appear as if some public works official had ordered this extra strut to be put in to prolong the life of the government property. It certainly clashes with pure native art as do the many smaller struts (*te'e*) that seem to prevail aroundthe regionof Apia.

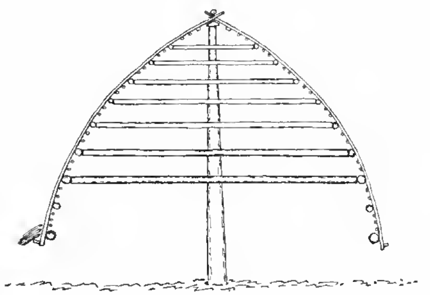


FIGURE 32.—Cross section of completed framework, middle section, round house.

The wall posts (*pou lalo*). These may or may not be erected at this stage. There are three on either side, one at each end under the end rafters, and one in the middle. Throughout they occupy an insignificant position structurally.

With the fitting of the collar beams, the temporary struts are removed, and the middle section (*itu*) is completed as far as the carpenters are concerned. They turn their attention to one of the end sections while the owner's party commence thatching the completed part.

The size of the house does not depend on the length of the middle section but on the spread of the roof which in turn is governed by the height. Tufele's house at Fitiuta, with a middle section length of 7 feet 6 inches, was 27 feet 6 inches wide. The house at Iva was only 4 inches longer, but it was 45 feet 6 inches wide. Its height, however, was 32 feet as against 20 feet. Misa's house was 6 inches longer than the Iva one; owing to its lesser height it was not nearly so wide. The middle section was a structural necessity to which the rounded ends could be added.

TALA ROUNDED END SECTIONS

The end sections of the long house and the round house are the same in every detail of construction. The main features are the curved wall plate which thus becomes a curb plate, the curved main purlins built up of several pieces to form arches, and the continued disappearance of principal rafters.

Preparation of curb plates and arched purlins. With the solid wood needed for large houses, it is no longer possible to bend a straight piece into a curb plate, nor is it compatible with the status of the house to use the split curved purlin (*fau sasae*). The arches, whether curb plate or purlin, are made of short lengths of breadfruit wood, worked to a slight curve and joined together. The verb "to lash" is *fau*, and because the arches are lashed together, they are all termed *fau*. The curved purlin name, therefore, is derived from construction. In time, the name became associated with function, and was then applied to the split purlin which is not lashed together. To mark this difference, the qualifying word *sasae* (split) was always used with the split purlin (*fau sasae*). The split purlin must have had some other older name that has been dropped or was not obtained by me.

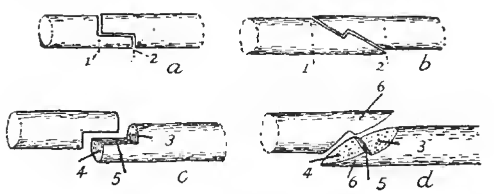


FIGURE 33.—Right-angled and slant joins: *a*, the right-angled join where the overlap (1-2) is comparatively short for lashing purposes; *b*, by slanting the end surfaces, the overlap (1-2) is considerably lengthened; *c*, the right-angled join with short vertical surfaces (3, 4) and a longer horizontal surface (5) resists inward pressure but not outward pull; *d*, the slant join with the surfaces (3,4) lengthened and the middle surface (5) shortened as the function of overlapping held by this surface in the right-angled join has been transferred to the longer slant surfaces (3, 4). The short surface (5) prevents outward pull taking effect; it is termed the *lave* and the thinner part (6) beyond it that runs to a point is the *ulupale*.

The shaping of the short lengths is carried on by the older carpenters in the shed while the middle section is being constructed. The thickness of the pieces varies with the different arches as does the amount of curve. Beyond the fact that the curb plate must be the same diameter as the wall plate, the middle arch a little less, and the other arches graduated smaller, the workers rely on experience. If a piece of wood is spoiled for one purpose, it can be used for another and the cost of material is not borne by the builders.

Each end of the pieces is shaped for the joint except the parts that form the ends of the arches. The join is the *so'o mata sai*, already seen in the thatch rafters. The curve of the wood forms no difficulty. The right-angled

join sometimes used in straight beams, such as the collar beams and the main plates, is shown in figure 33. When lashed—for the Samoans did not use nails—a pull away from the joint is not resisted except by the tightness of the lashing. The join thus acts as a strut against longitudinal inward pressure towards the joint, but is weak as a tie in preventing outward pull. In the slanting join, the opposite holds. Inward pressure toward the joint is not resisted by the structure of the joint, but by the lashing keeping the overlap together. Outward pull is structurally resisted by the locking of the two middle surfaces. The right-angled join could have been made on curved pieces just as readily as the slanting join, and improved for lashing by lengthening the middle surface. The preference for the slanting join will be evident later when the arches are erected. The curved lengths are fitted together to form arches, which, in the house, are directed with the convexity upwards and outwards. (See fig. 34.)

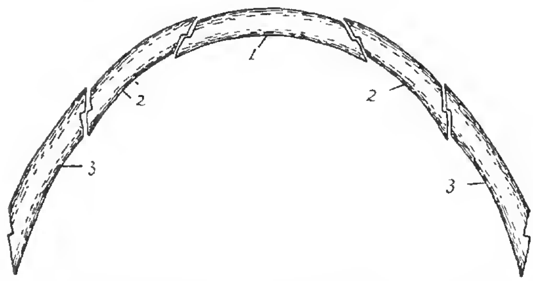


FIGURE 34.—Joins of arch showing key piece, *pu'e*: 1, the middle piece that forms the top of the arch and acts like a key piece (*pu'e*), shaped so that the *ulupale* point at either end is on the lower and inner concave side of the piece; 2, the *lango pu'e*, pieces on either side of the key piece, with the *ulupale* points at their upper ends on the upper and outer convex sides of the pieces so as to fit against the lower ends of the key piece. Their lower ends are shaped to form the *ulupale* on the opposite inner concave sides; 3, the succeeding pieces are all shaped like the *lango pu'e*.

The concave part looks directly into the house, *totonu*, and the convexity faces away, *tua* (outside, back, towards the thatch rafters). In Samoan, the expressions used for the upper ends of the *lango pu'e* and other pieces is *ulupale i tua,* and for the lower ends, *ulupale i totonu*. For the *pu'e* both ends are *ulupale i totonu*. (See Plate II, *A*.)

Assembling the arches. The curved pieces are assembled outside the shed in an open space that permits of the full arch being laid out on the ground.

A length of sennit is stretched between the ends of the wall plates of the middle section, and the distance pegged out on the ground as (1) and (2) in figure 35.

The first arch assembled is the curb plate (*fau lalo*). As the joints are fitted, they are temporarily lashed together around the middle of the joint, or with two lashings; one on either side of the middle, with *fau* bark. Wedge-pointed wooden pegs (*tina* or *matalafi*) are driven in under the lashing on the concave side to tighten them. These fitting lashings are termed *u'a vale*.

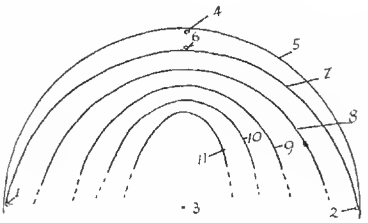


FIGURE 35.—Assembling the curb plate, middle arch and upper series of arches: 1 and 2, side pegs marking distance between inner sides of wall plates of middle section of house; 3, middle peg, located by doubling braid stretched between the pegs (1 and 2); 4, apical peg, located by stretching doubled braid from peg (3) at right angles to the line (1, 2); 5, curb plate curve; 6, peg, four hand spans from apical peg to mark curve of middle arch; 7, curve of the middle arch (*fautu*); 8, curve of next arch of upper series (*fau vaenga*); 9, 10, curves of succeeding upper series arches; 11, curve of uppermost arch (*fau tali 'aso*).

The fitted curb plate is tested on the marked ground. The middle of the key piece must rest against the outer side of the apical peg. The ends (*si'u fau*) must then touch the outside of the side pegs. In figure 35, the curve (5) so formed makes a perfect semicircle, but it is rarely that the curb plate conforms exactly to a semicircle. In a very large house, the ends are prolonged past the side pegs, and in smaller houses they fall short. In either event the width of the ends must be the same as that between the side pegs in order to junction perfectly with the wall plates of the middle section of the house. In the large house at Iva, with the width of 45 feet 6 inches, the *tala* length was 9 inches greater than half the width. In Tufele's smaller house with a width of 27 feet 6 inches, the lengths of the two *tala* were 1 foot 1 inch, and 2 feet 2 inches shorter than half the width.

When the ends are inside or too much outside of the pegs, the arch has to be corrected. The head builder stands outside the apical peg, and studies the curve on either side to pick out what joints should be altered. The joint or joints are then removed with the lashing still round them by unfastening the two ends away from the joint. The offending joint is taken to the shed and reshaped to lessen or increase the curve as required. The corrected joint is relashed in position, and the arch again tested. When the whole arch is correct, the lashings are termed *u'a mau* instead of *u'a vale*. The term *mau* (fixed) means that the arch is fixed as regards shape.

The middle arch (*fau tu*) is next laid down. The pieces of the middle arch, which is the largest of the oblique arches, are assembled like the curb plate. It is tested by placing the midpoint of the key piece against the inner side of its peg. The ends must then touch the side pegs as in figure 35, 7. When correct, the stage is called *ua u'a le fautu*. The middle arch is lashed together. The curb plate is removed and set up in the frame while the assembling of the arches is continued by the experts.

The remaining arches are divided into an upper and a lower series of even number which are separated by the middle large arch, just assembled. To understand the method of assembling, it must be remembered that the middle arch is the direct descendant of the middle curved purlin seen in the rounded ends of the cooking and dwelling houses. In position, its lower ends rest on the curb plate at its junction with the end wall posts, which are directly under the end rafters of the middle section. They bisect the right angles formed by the line of the end rafters and the curb plate. The arch directed upwards and outwards divides the roof portion of the rounded section into two equal parts in the middle line. The tops of the upper series of arches are evenly spaced along the middle line, and their lower ends have to rest against the end rafters of the middle section. Thus, from below upwards, the upper series not only decrease in the diameter

of the wooden pieces used, but also in the height of the arch and the distance between the lower ends. As a result the curve of the arches narrows from the middle arch upwards. They are thus tested on the inner side of the middle arch, which is left on the ground for this purpose. The first arch of the upper series to be assembled is the one next the middle arch (upper *fau vaenga*). It is laid out on the inner side of the middle arch, and follows its curve (fig. 35, 8) for a certain distance, but the actual length of its sides is left for the framework to decide. It is left on the ground, and the next of the series laid down inside of it. The others follow consecutively as shown in figure 35. The apical curve becomes sharper as they narrow. The last of the series is the *fau. tali'aso.* Within the limits of the rule laid down, experience guides, and no exact rules can be formulated.

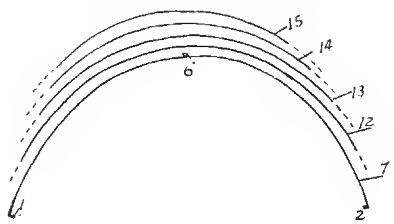


FIGURE 36.—Assembling of arches of lower series: 1, 2, side pegs marking width of middle house section; 6, peg marking apex of middle arch; 7, middle arch left on ground to give line of curve for lower series of arches; 12, first arch of lower series (lower *fau vaenga*) next to middle arch; 13, 14, 15, remaining arches of lower series, in order from above down. The general curve is shown but the indeterminate ends are indicated by dotted lines.

The lower series of arches to occupy the lower section of the roof are rested on the curb plate, while their upper parts are evenly spaced along the middle line. They range along a curvature which does not contract, though their length naturally shortens as they descend. They are thus tested on the outer side of the middle arch still left on the ground. (See fig. 36, 7.) The first assembled is the one next in position to the middle arch, and it is termed the lower *fau vaenga*. If follows the wide outer curve of the middle arch, and like those of the upper series, the exact length is left for decision on the frame. When the lower *fau vaenga* is lashed as correct (*u'a mau*), the middle arch is taken away and set up. The remainder of the lower series are laid down consecutively on the outer side of the one preceding. Their ends are all left indeterminate.

From the above method it is seen that the curb plate and the middle arch are the two elements that are exactly determined when assembled. All that is needed with the other arches at this stage is the curve of each for setting up in the middle line. Calculations as to length were not attempted, not because it was beyond the mentality of the Samoan builders, but because it was left for the later technique to decide in a practical and certain manner.

Scaffolding. Before the erection can be commenced, the scaffolding (*fatamanu*) must be extended to the end section. The method of supports for the

cross pieces or rungs are similar to the straight rafters in the ends of the cooking houses. Figure 37 shows the right half of the end scaffolding. All lashings are made with *fau* bark. The other side is similarly constructed. Plate II *B*, shows an end scaffolding.

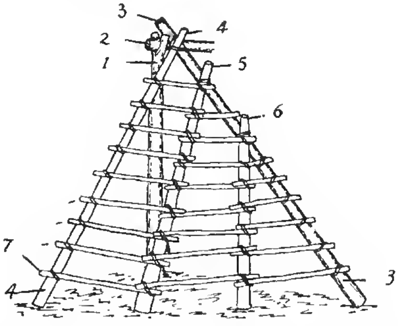


FIGURE 37.—Scaffolding of rounded end section: right half viewed from outside opposite its middle. The forked supporting post (*to'o manga*) (1) of the other scaffolding, supports the crossbar (2) against which the oblique timber (3) rests. The new elements are 3 oblique heavy pieces of timber which are leaned against the upper part of (3). Of these, the longest (4) is placed slightly to the right of the middle long axis of the house with the upper end resting on the old oblique timber (3) close to the supporting post (1). The lower end rests on the ground beyond the projected line of the wall posts. The other two timbers (5 and 6) have their lower ends placed on the ground beyond the wall post line so as evenly to divide the space while the upper ends are tied to the oblique timber (3). The oblique timbers, like the ones in the middle section, are *fata sasau* or *fata vala*. The cross pieces, also called *teleteleanga* or *papani* (7) are tied on in the usual manner.

Erecting the curb plate. The curb plate is carried into position and temporarily strutted while its ends are lashed to the end rafters immediately below the wall plates. (See fig. 38.) Some curb plates are cut away at the upper edge so as to fit against the wall plate, and bring the upper edges closer together.

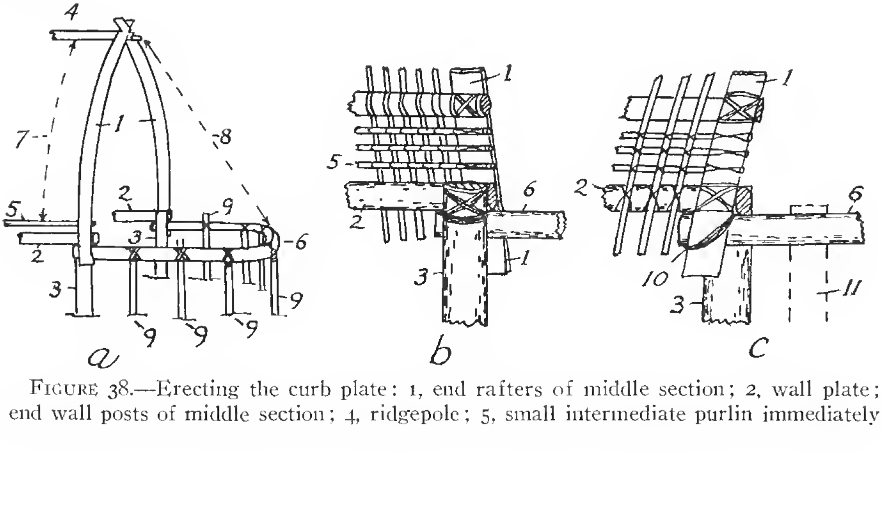


FIGURE 38.—Erecting the curb plate: 1, end rafters of middle section; 2, wall plate; 3, end wall posts of middle section; 4, ridgepole; 5, small intermediate purlin immediately

above wall plate; 6, curb plate: *a,* the level of the middle of the curb plate is fixed by the measure of the distance (7) between the ridgepole and the small intermediate purlin immediately above the wall plate. One end of a measured line (8) is held against the end of the ridgepole, and the line is stretched obliquely downwards in the middle long axis of the house. The ends of the curb plate are placed in position below the wall plate ends and the middle is raised or lowered until the end of the taut measuring line touches its upper surface. The curb plate is then restrutted in position with about 7 struts (9) which may be cut to exact length for propping under the curb plate or left long and tied against the side. The short struts are tied in the same way as the collar beams to the purlins, but with *fau* bark and with not so many turns. The correct level of the curb plate is important, for if too high (*sisi*) or too low (*tautau*) it is justly regarded as poor work. *b,* Side view from inside, showing the position of the curb plate end below the end of the wall plate on the outer side of the end wall post of the middle section; *c,* side view from outside, showing the curb plate below the wall plate and temporarily lashed (10) to the end rafter of the middle section. Later a wall post is erected in position (11) to permanently secure the curb plate.

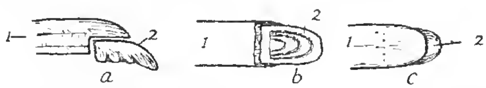


FIGURE 39.—Fitting of ridgepole end piece (*moamoa*) to end of main ridgepole: 1, ridgepole; 2, end piece: *a,* side view, showing the end of the ridgepole cut away to receive the end piece and rounded off to conform with the slope of the upper surface of the end piece; *b,* under view, showing the end piece fitted in under the ridgepole; *c,* upper view, with ridgepole overlapping the end piece.

Ridgepole end piece (*moamoa*). A short end piece is placed at the end of the main ridgepole to serve as a rest for the upper ends of the thatch rafters attached in the middle line (*'aso vao*). Two forms are used:

(1.) A flat piece of wood barely as wide as the ridgepole, and from 7 to 9 inches long, was let into the under surface of the ridgepole which was cut as in figure 39. The under surface was also carved with curved lines as shown. Some are painted with dots and triangles, and others, according to Handy (14, p. 8), "are carved in symbolic representation of the moon and stars." From above the ridgepole overlaps part of the *moamoa,* and the even continuous slope downwards, by breaking the abrupt ending of a squared end, affords an even slope conforming to the plane of the middle rafters.

(2.) The construction of the second type is totally different. A curved piece of wood is placed transversely against the squared end of the ridgepole, and the outer edges of the end rafters, but is not lashed against them. (See fig. 40.)

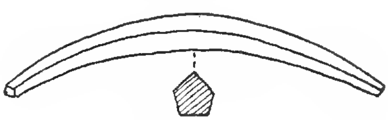


FIGURE 40.—Second type of end piece (*moamoa*). Specimen seen on Tutuila, 37 inches long, 5 sided, and narrowing towards the ends. In the middle, the under surface was 2.5 inches wide and the other 4 surfaces 2 inches each.

Another variety was round in section, like a curved purlin, and extended directly upwards along the edges of the end rafters, its ends coinciding with the highest main purlins (not *talava*) on either side of the middle section of

the house. The curve is much sharper, and gives the lateral curve to the middle series of thatch rafters.

The middle longitudinal curve. The guide to the contour of the curve in the middle line from the ridgepole to the mid point of the curb plate, is given by 5 or more thatch rafters termed *'aso vao.*

The middle arch is first lifted with ropes (*tautala*) into position with its ends on the curb plate where it sets against the outer end of the wall plate. The ends may be shaped to fit the angle. Its upper arched end is placed in approximate position, and temporarily strutted in the middle line, and on either side. (See fig. 41 *a.*)

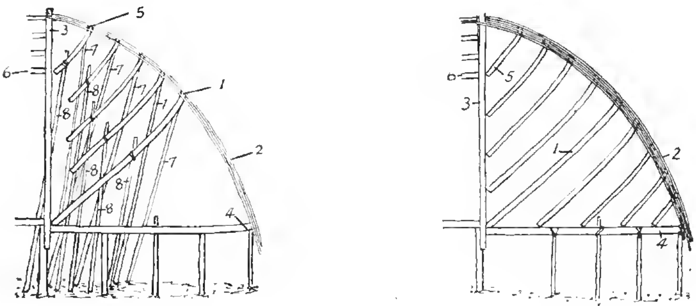


FIGURE 41.—Erection of arched purlins: *a,* strutting middle arch and upper series of arches: 1, middle arch kept in position by mesial and lateral struts; 2, thatch rafters (*'aso vao*) in middle line, attached above to ridgepole end piece and passing over middle arch and curb plate; 3, end rafter of middle section, with some of outer *'aso vao* attached to it at their upper ends; 4, curb plate showing ends of middle arch resting on it at junction with wall plate; 5, topmost arch (*fau tali 'aso*); 6, third highest main purlin of middle section; 7, poles used as mesial temporary struts for arches; 8, lateral temporary struts. The thatch rafters are tied in the middle line to the end piece and the end rafter and passed over the middle arch and curb plate. The spacing of the arches is done in the same manner as the spacing of the straight purlins of the middle section on the curved principal rafters. Here the mesial thatch rafters take the place of the principal rafters of the sides. A line is stretched from the ridgepole end piece to the middle of the curb plate over the thatch rafters. The measured line is divided equally into the number of parts required for the whole series of arches including the middle arch, and marked as before with *fau* bark. The line is again stretched over the mesial thatch rafters and the points, where the strips of bark touch, are marked with charcoal. The middle arch is then adjusted to coincide with its correct mark. The arches of the upper series are lifted into position with ropes, commencing with the highest (*fau tali 'aso*) which receives its name from *tali 'aso* (to guide or receive the thatch rafters). The middle of the arch is placed against the under side of the mesial thatch rafters against the highest charcoal mark and the lower ends are directed towards the ends of the third highest purlins (6) of the sides. It is temporarily strutted in position with one mesial strut and usually 2 lateral. The remaining arches of the upper series are lifted into position and strutted. The highest and the middle arches are complete as regards their ends but the ends of the other arches are left short to be added to as work developes. *b,* Complete series of arches in position. The lower series of arches are added in a similar way to the upper, but not usually until further thatch rafters have been added. The figure, however shows their relative position on the framework. When placing the mesial struts of the upper series, the arches are pushed up so that the curve may be even between the ridgepole and the middle arch.

When the arches have been placed in their correct position, they are lashed to the mesial thatch rafters that are in position in order from above downwards. More thatch rafters are added on either side of the middle set, working outwards on either side. As the work expands outwards, the arches of the lower series are successively added from above downwards so that the lowest comes comparatively late into position.

The lower ends of the arches. Attention has already been drawn to the fact that with the exception of the middle and topmost arches, the lower ends of the remaining arches are purposely left short. This feature is shown in the arches of the upper series depicted in figure 41*a*. Both the longitudinal and lateral curves of the rounded end of the frame are maintained by the strutting of the arches. The exact length of the incomplete arches can therefore well wait until the advancing construction decides it. As the addition of thatch rafters approaches the short ends of the arches, additional pieces are added to lengthen them. The pieces being made to plan, as regards the joints (fig. 34), can be easily fitted with a temporary lashing as if they were on the ground. In the upper series, the boundary of length is the outer edge of the end rafter of the middle section. When a piece reaches the rafter, it is held in position at the joint and the point of contact is marked with charcoal. The piece is cut off square with its long axis and attached to complete the arch. The order of completion is, of necessity, from above downwards. In the lower series, a similar method is used to make the lower ends coincide with the upper edge of the curb plate. The completed arches are parallel to each other, the line having been set by the middle arch. The lower ends of the arches merely touch the end rafters and curb plate (fig. 41*b*) and are in no way attached to them. They maintain their position by the lashings to the thatch rafters. The method of finishing off the lower end of the arches thus decides their length in a practical manner without any mathematical calculations which may have been beyond the scope of the builders. In some houses, the ends of the arches were observed to touch the main purlins of the sides, but with the exception of the topmost arch. However, this may be regarded as a coincidence.

The number of arches ranges with the size of the house. Four above and four below the middle arch, making nine in all, is a fair average. The large house at Iva had 12 above and 12 below, making a grand total of 25 arches.

The middle arch is both the longest and largest in diameter. The others decrease in diameter outwards from the middle arch. In the Fitiutan house described, the middle arch was 5.25 inches in diameter. The lower series of four, from above downwards, were 4.75, 4.25, 4, and 3.75 inches respectively. The curb plate was the same size as the middle arch, 5.25 inches, while the wall plate was larger with 5.75 inches. The individual arches were of the same diameter throughout from middle to ends. The ends were all cut square with the long axis, except the middle arch, which was shaped as described.

Lashing the thatch rafters. The thatch rafters are first attached at their upper ends to the *moamoa* end pieces in the middle line, and then to the end rafters as they diverge on either side. These lashings are the only real connection between the framework of the end and middle sections. The short *moamoa* of figure 39 is a very small intermediate connection between the thatch rafters and the ridgepole, while the second curved type forms no connection at all. The arches merely touch parts of the framework of the middle section. The lashing of the curb plate to the end rafters is temporary to get its right level. The stability of the house shows the strength of a combination of weak elements, such as the thatch rafters.

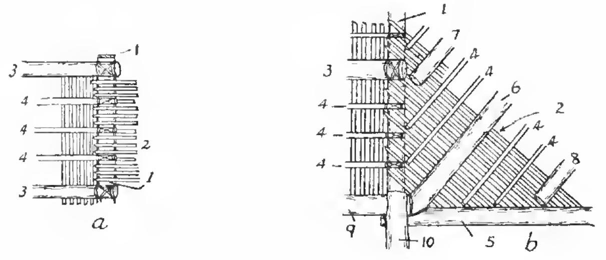


FIGURE 42.—Thatch rafter crossings over the under surface of the end principal rafters of the middle section: 1, principal end rafter; 2, thatch rafters; 3, principal purlins; 4, intermediate purlins; 5, curb plate; 6, middle arch; 7, arch of upper series; 8, arch of lower series; 9, wall plate; 10, wall post; *a*, the thatch rafters cross the principal rafter at right angles in the upper part of the roof. As the addition of thatch rafters proceeds outwards and downwards along the principal rafter, the crossings become more oblique owing to the curve of the curb plate. *b*, Lower end of principal rafter (1). As the main (3) and intermediate (4) purlins of the middle section are already lashed in position on the principal rafter, the oblique course of the thatch rafters is here and there prevented from reaching the inner edge of the principal rafter. The pointed ends of the thatch rafters are then thrust in under the transverse purlins and the lashing turns can only be made around the thatch rafters at the outer edge of the principal rafter. The middle arch (6) is shown with its end shaped to fit against the end of the wall plate (9) and the curb plate (5). The curb plate is also cut away on its upper part to fit closer to the wall plate.

The pointed upper ends of the thatch rafters are passed across the inner or under surface of the end rafters to project beyond their inner edge. (See fig. 42.)

The lashing to the end rafters is the same as that of the intermediate purlins to the main rafters in the middle section (fig. 25). The sennit brait is tied round the end rafter with the slip knot-commencement. (See fig. 43.)

The lashing to the end rafters is termed *fatu-o-le-ulu-'aso*. Each thatch rafter is lashed to each arch it passes over. The order is again from above downwards so that any bends in the thatch rafters may be straightened out permanently by the successive lashings. On each arch, the lashing is of necessity from the middle line outwards as the thatch rafters have to be kept parallel with those first laid down in the middle line. The spacing is the same as in the middle section of the house.

As the thatch rafters work outwards, the lashings come to the joints of the arches.

The technique is shown in figure 43*c*. There is no technical difficulty, though a badly fitted arch may sometimes be seen gaping slightly at a join.

All thatch rafters reach the curb plate and are lashed to it in the same way as to the arches.

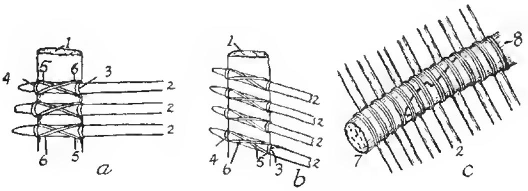


FIGURE 43.—Lashing of thatch rafters: 1, end rafter of middle section; 2, thatch rafters; 3, 4, 5, 6, lashing turns; 7, 8, two pieces of arch showing join: *a*, lashing of upper thatch rafters to end rafter. The braid attached to the end rafter makes a transverse turn (3) around the thatch rafter on the right side of the end rafter from below upwards and passes diagonally across the back of the end rafter to appear at the left lower corner. Another transverse turn (4) around the thatch rafter is made from below upwards, when the braid makes another diagonal turn across the back of the end rafter to appear at the lower right corner. From here the braid makes a diagonal turn (5) upwards across the thatch rafter to the left upper corner, passing transversely across the back of the end rafter to appear at the right uppper corner. Another diagonal turn (6) is made across the thatch rafter. The lashing is finished off with a circumferential turn around the previous turns by passing the braid around between the two wooden elements. The braid then passes on to the next thatch rafter. *b*, Lashing of lower obliquely running thatch rafters to end rafter. The technique is similar to the above, but it is obvious that when the oblique rafter is prevented by a side purlin from reaching across the end rafter, the transverse turn (4) around the thatch rafter can not be made. The turns (3, 5, and 6) are made to make the lashing as secure as possible, but the irregular appearance caused makes the lashing appear untidy. *c*, Lashing of thatch rafters to arch. The thatch rafters are lashed to the arch in exactly the same way as they are to the straight main purlins of the middle section (fig. 23.) Here the 2 turns on either side of the thatch rafters are shown. On coming in contact with a join, as shown between the pieces (7 and 8), the temporary lashing of *fau* bark (*u'a mau*) is removed and the two pieces held together at the join by an assistant. The thatch rafters are spaced in the usual way and the lashing simply continued around the parts forming the join as if there was no break in continuity. When the work has gone past the join, the two pieces (7 and 8) are securely lashed together.

Intermediate small purlins are added between the arches in the same way as in the middle section. They are finer than those of the sides, being simply the same as the thatch rafters with the *so'o mata sai* joins. They readily take the curve of the end section. They are two to each space between the arches and three between the lowest arch and the curb plate. Those above the middle arch are brought to the outer edge of the end rafters and those below to the curb plate. Their relative position is shown in figure 42 *b*. When a larger number of arches than usual diminish the spaces between them, there may be only one intermediate purlin used instead of two.

The eave battens are attached to the lower end of the thatch rafters by the same lashing as in the middle section. Shorter straight sections are used to take the curve.

The wall posts supporting the middle and ends of the curb plate are usually erected by builders.

The other end section is erected in the same way, but they rarely agree in exact length. When brought to the same stage as described above, the work of the builders is ended.

Variations in construction occur through the builders introducing something new to advertise themselves. At Ngataivai, Savaii, the curious arrangement of arches, shown in figure 44, was observed.

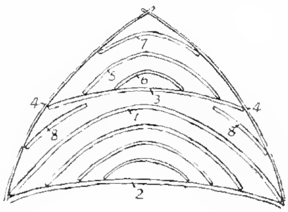


Fig. 44

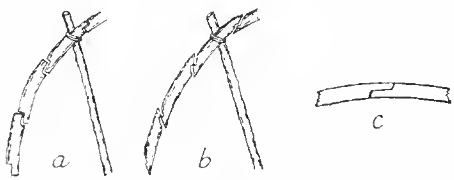


Fig. 45

FIGURE 44.—Unorthodox arrangement of arches: the lower series of three arches below the middle arch (1) rested in the normal way on the curb plate (2). Above the middle arch, the curb (3) was laid horizontally with its ends touching the end rafters (4). It resembled an upper curb plate, not only as regards direction, but also because 2 arches (5 and 6) had their ends resting on it. The uppermost *fau tali 'aso* (7) was normal in position. Two pieces like the lower limbs of an incomplete arch (8) filled the space between the end rafters and the middle arch. It was not an improvement in appearance, but it is figured, as new inventions are discovered through such departures from the normal.

FIGURE 45.—Position of arch joins during construction: *a*, theoretical square joins allowing lower pieces to work off by weight; *b*, slant joins (*so'o mata sai*) with intermediate *lave* surfaces acting as hooks to take weight of lower pieces; *c*, modified square join (after Handy).

Use of the slant join (*so'o mata sai*). Why the slant join should be preferred to the square join is not so obvious when the arches are in position and the framework lashed together. The slant join resists a pull or force that would tear the join apart. The weight of the roof, however, should exercise a downward pressure towards the joins, especially in those arches resting on the curb plate. The only outward pressure to separate the joins could be exercised by the wind blowing in under the roof. But the fact that the ends of the arches are not fastened in any way to the end rafters or the curb plate would make the form of the join of no extra value in resisting such a contingency. The roof would have to depend on the lashing of the thatch rafters and means of shutting the wind out. The Samoan did not enter into a scientific consideration of strains and stresses, but progressed from one obvious advantage to another. The obvious advantage of the join occurred during construction when the arches were lifted up with ropes and tempo-

rarily strutted in position. The weight of the arches was considerable, and the ends hung down beyond the lateral struts. If square joins were used (fig. 45 *a*), in spite of lashings, some of the end pieces would work loose and pull off. The join depicted by Handy (fig. 45*c*) is a slight modification of the square join and does not clearly represent the slant *so'o mata sai* join as he intended. With the true slant join, however, the *lave* surfaces at right angles to the slanted surfaces formed a hook or projection, which materially assisted in preventing the lower pieces from dropping off. The same applies to the long thatch rafters after their upper ends are fixed. There was considerable weight on the lower ends, and much movement when they were spaced and stretched on the various purlins and arches. The short *so'o mata sai* join was used on the small thatch rafters for the same reason as in the larger arches; it prevented the lower pieces from dropping off during construction. Thus many obscure points in the completed object are simply explained by the steps in construction, but unfortunately the technical details are not always available. Failing these details, highly scientific reasons may be credited to a people who obtained them as end results in carrying out some totally different thought process that provided simple and obvious advantages.

Wall posts (*pou lalo*). The erection of the wall posts was completed by the people of the *taufale*. Any suitable wood was used. The bark was peeled off leaving rounded posts from 5 to 6 inches in diameter. The lower ends were imbedded in the ground, and the upper ends attached to the wall and curb plates. The length was thus decided by the distance the wall plates were suspended from the ground. When a high *paepae* platform was made, most of the posts did not reach the ground level, though they were sunk below the floor level. When the floor was put in, the height from the ground to the wall plate usually ranged from 6 to 7 feet. The house at Iva was exceptional with wall posts 7 feet, 10 inches in height. It seems probable that they were shorter in early times, for Wilkes (42, vol. 2, p. 71) describes the house occupied by the Tui Manua at Olosega in 1839 as being about 3 feet, 6 inches from the ground to the eaves. Allowing an extra foot for the eaves, the wall posts would be still lower than in buildings of the present day.

The number of posts on each side of the middle section were three, and in Manua, four. For the end sections, the middle wall post was of most importance. A post was put in at the ends of the curb plate, quite close to the outer posts supporting the wall plate. Between these two posts and the middle post, an equal number were evenly spaced on either side. Thus the number in the end sections was always odd. In the fair-sized Fitiutan house, there were fifteen, making 38 wall posts altogether. The very large Iva house had 3 on either side of the middle section, and 27 in each end section

making a total of 60. The top ends of the posts were cut on the outer side to receive the wall plates and curb plate. Handy (14, p. 12) gives three methods of cutting the top. (See fig. 46 *a, b, c.*) My experience was that the post was not usually cut square as in *a*, but at a slant as in *d*. The shaping of the post to receive the plate is termed *fa'afulu lupe*. The naming marks the transition to better workmanship. The shaping is not so much to give extra support to the plate as to provide better fitting. In many of the posts examined the plate did not rest on the bottom of the notch. This feature is seen in figure 47 *j*. It draws attention again to the fact that the plates receive their support from above, from the already fixed rafters. Many of the posts are quite loose, and can be removed without materially affecting the support of the roof. The Samoans themselves drew attention to this fact.

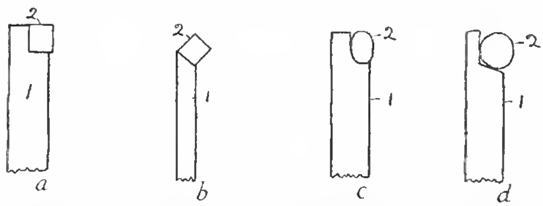


FIGURE 46.—Types of wall posts cut to receive plates: 1, wall post; 2, wall plate: *a*, post cut square; *b*, post cut at slant; *c*, post cut on curve; *d*, post cut at obtuse angle. (*a*, *b*, and *c*, after Handy.)

The lashing is simple and follows the rafter-ridgepole lashing (fig. 17) and the rafter-purlin lashing (fig. 20). Where two wooden elements cross each other at right angles the simplest ties consist of using transverse and diagonal turns. The turns are made carefully on the surface that shows so that the ornamental design may be apparent. On wall posts, the decorative surface is the inner part of the upper end which is defined into a rectangular space bounded by the upper and lower borders of the horizontal wall or curb plate at the back. The surface is convex from side to side so that the actual corners of the space may not be seen directly from the front. In Samoan technique the diagonal and transverse turns are the complement of each other. Transverse turns are those at right angles to the long axis of the wooden element so that on the post they are horizontal while on the plate they are vertical. If transverse turns are made over one wooden element, diagonal turns must follow on the other crossing element and vice-versa. All lashings are finished off with a few circumferential turns passing around the outside of the previous turns where they cross between the two wooden elements. Of various designs used, the simplest is the single lozenge (fig. 47) common in the houses on Manua. A more common lashing in other parts is accomplished by the addition of transverse turns around the post above and below the single lozenge. (See fig. 48.) Two other lashings are shown in figure 49.

Of the four lashings depicted in figure 50, the first (*a*) is identical with that used on the back of the supporting post when lashing the collar beam to it. (See figure 30 *b* and *c*.)

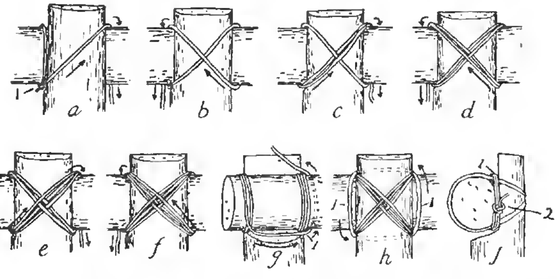


FIGURE 47.—Lashing of wall post—simple lozenge: *a*, the end of the working hank is fixed to the wall plate on the left by the usual running noose (1), drawn taut at the lower border and the braid carried diagonally upwards across the post to the righ upper corner whence it passes vertically downwards behind the wall plate; *b*, from the right lower corner, the braid is carried diagonally upwards across the post to the left upper corner and vertically downwards behind the wall plate; *c*, the third turn is kept immediately below the first turn; *d*, the fourth turn from right to left follows below the second turn; *e*, the fifth turn must now pass from left to right immediately above the first turn to produce the lozenge motive; *f*, the sixth turn passes from right to left immediately above the second turn to complete the foundation of the lozenge motive; *g*, back view with the vertical transverse turns around the wall plate. From the last diagonal turn in front, the braid is brought to the back and makes a circumferential turn (1) around the previous lashing turns by passing around them between the wall plate and post; *h*, front view with the vertical parts of the circumferential turn (1) which on being drawn taut are hardly seen from the front; *j*, side view with the wall plate in section. One or more circumferential turns (1) may be made and the braid is fixed by an overhand knot (2) or a series of half-hitches around the previous turns at the side.

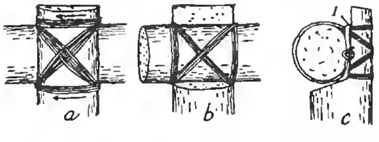


FIGURE 48.—Lashing of wall post—lozenge motive with horizontal turns above and below: *a*, on finishing the last diagonal turn (fig. 47*f*) the braid passes diagonally downwards to the right behind the wall plate and makes a transverse horizontal turn from right to left over the front of the post. It then passes diagonally upwards to the right behind the wall plate and makes a horizontal turn from right to left over the front of the post above the lozenge motive. The above turns are made alternately below and above until transverse bands of three or more turns have been added to the simple lozenge lashing in figure 47*f*. *b*, A back view showing the diagonal turns on the back of the wall plate which have been added tothe vertical turns shown in figure 47*g*; *c*, a side view, showing the finishing circumferential turns (1) with the braid ended by an overhand knot around them.

The wall posts are collectively termed *pou fesisi*, and also *atuao* on Upolu according to Pratt (23, p. 36), who relates that it literally means "the row of chiefs' heads." To put in a post is *poupou'i*, and to replace a rotted post with

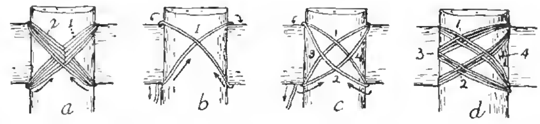


FIGURE 49.—Lashings of wall posts—lashing design: *a*, adz handle lashing; the first two turns (1 and 2) follow the opening technique of the single lozenge design (fig. 47*b*), but the crossing is made high up as the design is developed below the first two turns. The next two turns are made immediately below the preceding as in the second stage of the lozenge design (fig. 47*d*). The succeeding turns, instead of passing alternately above and below, are made immediately below the preceding turns. The lashing is commonly used in hafting carpenters' adzes. *b*. Four curve lashing; the first two turns are diagonal but made with curves to cross (1) well above the middle transverse line of the space. After each diagonal turn over the front of the post, the braid descends vertically behind the wall plate. *c*. The next two turns are diagonal but curved in the opposite direction so as to cross (2) below the middle transverse line. Two other crossings (3 and 4) are automatically formed at the sides on the middle transverse line. *d*, The upper and lower crossings (1 and 2) are treated alternately like the single crossing in the single lozenge design. Single turns from right to left and left to right are made immediately below the first two turns which formed the upper crossing point (1). Two similar turns are made in the same relation to the second two turns which formed the lower crossing point (2). Two turns are made above the first two turns forming the upper crossing point (1), followed by two similar turns above the lower crossing point (2). This completes the lashing, which, besides forming simple lozenges at the upper and lower crossing points (1 and 2), have automatically developed similar lozenges at the two side crossings (3 and 4). Owing to the convexity of the surface, both side lozenges cannot be seen at the same time viewed directly from the front but the oblique view shows that on the right (4).

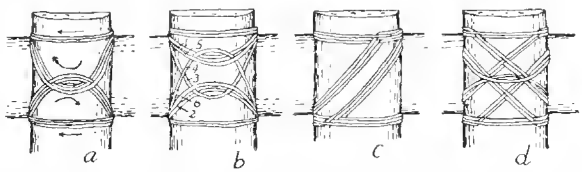


FIGURE 50.—Lashings of wall posts—lashing designs: *a*, alternating curves to pass above and below the middle transverse line are made as on the back of the supporting post (fig. 30 *b* and *c*) and finished off with transverse lines across the post as in the technique of figure 48*a*; *b*, a series of two short upper and lower curves not reaching to the middle transverse line are formed with two longer single loops passing between the elements of the short pairs. The order in which the individual turns are made is shown by the numerals. *c*, The design is formed of alternate diagonal and transverse turns. The set that goes obliquely upwards from the left lower corner does not go direct to the upper corner but in a line to the left of it and then turns outwards to the corner. The lower set of diagonals runs transversely inwards from the left lower corner and then turns obliquely upwards to the right upper corner. The transverse turns cross the diagonal turns where they turn in towards the corners and thus fix them in their relative positions. *d*, A variation to *c* is formed by crossing two sets of diagonal parallels which may be finished off with two curved loops which cross each other in the middle transverse line.

a new one is *suitu*. The middle post of the right round end of the house is termed *to'o matua tala*. The middle posts at either end are often distinguished by being larger, ornamented with a more elaborate lashing, or even carved. A

small post closely set on either side of it, or two posts close together in place of one are further distinctions to mark the site of the middle of the rounded ends. Though the small posts are insignificant structurally they become very important in ceremonial.

THE ROOF

The outer elements of the roof framework consist of the thatch rafters, 2 to 3 inches apart. As only every eighth rafter or so is used for tying the thatch to, their close setting emphasizes their use in strengthening the roof structure and adding ornamentation not only in themselves but in the extra sennit bindings round the purlins.

The thatch material consists of the sugar cane leaves (*tolo*) for the superior houses, and of the coconut for others. Pandanus leaves (*lau fasa*) are said to have been used in the remote past.

Different kinds of sugar cane are recognized, but the *fatu*, with narrow leaves and a dark skin, was used for thatch. The leaves are collected (*fua*) by women and carried in large bundles strapped to the back (*fafanga*). The leaves were stripped with the sheath part that enclosed the cane still attached to the leaf. In the village they are sewn together (*sui*) over light rods of cane (*u*) or the stem of a creeping plant (*lafo*). The leaves are pinned together with dry coconut leaflet midribs (*tuaniu*), the hard butt end acting as a needle point. The sewing of thatch sheets is done by a working bee of women relatives. Handy (14, p. 9) records that in British Samoa extra labor is employed at a rate of one pound sterling per hundred sheets.

The rods range from 3 feet upwards. Large leaves may be used singly but small ones are placed together in twos and threes with the same surfaces facing in the same direction. (See fig. 51.)

The cane leaf is *lau tolo* while a thatch sheet of cane leaf is referred to as *lau*. Though *lau* is the general word for leaf, *lau*, as applied to thatch, definitely means sugar cane leaf.

Coconut leaflets, stripped from dried leaves and attached to rods, are used in good houses only when sugar cane is not procurable. Misa's large house at Ofu was thatched with coconut leaflets owing to lack of sugar cane on the island. The leaflet butt ends are doubled over the rods, and pinned with dry leaflet midribs in the same way as sugar cane.

All cooking houses and canoe sheds are thatched with plaited split leaves called *lau pola*. Here nature has supplied the rod in the form of the leaf midrib, and also attached the leaflets to it. The check technique of the plait will be be described on page 169 under "Plaiting." Plaited coconut sheets are not so waterproof as the pinned leaflets owing to spaces between the leaflets, but to obviate this, more are put on. They save labor, and are quite good enough for houses that are not lived in.

The thatch (*atofanga*), derived from the verb *ato* (to thatch), works upwards in rows or sections. Assistants place the sheets in position from outside while the thatchers from the scaffolding inside lash them successively with continuous sennit braid along the upward course of every seventh or eighth thatch rafter. Thatching commences on the middle section without waiting until the framework of the ends is finished.

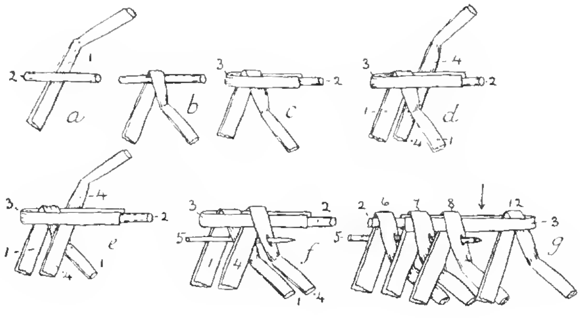


FIGURE 51.—Pinning thatch sheets of sugar cane leaf: *a*, with the sheath distal and the leaf midrib to the right, the blade is seized about 6 inches below the sheath junction, or ligule, and the sides pressed together so that the leaf is doubled longitudinally. The sheath end (1) is passed under the rod (2). *b*, The left hand holds leaf blade and rod together while the right hand doubles the sheath end down over the rod with a twist to the right; *c*, a strip of leaf (3) is doubled horizontally around the end of the rod and encloses the first leaf (1) against the sides of the rod; *d*, the second leaf (4) is placed against the rod to the right of the first, but the blade naturally is behind the sheath part of the first leaf; *e*, the blade of the second leaf (4) is lifted up on the right to clear the obstructing sheath (1) and then twisted to the left over it; *f*, the sheath of the second leaf is then doubled down over the rod (note that the second leaf has passed around the fixation strip (3) and in turn fixes it against the rod); the midrib pin (5) butt end first, is passed along from left to right a little below the rod and, parallel with it, passes in front of the first part of the first blade and behind its doubled-down part. Before it reaches the leaf midrib it is pushed through from the back. As the first part of the second leaf is in front, the pin naturally passes along behind it. It passes behind the second part of the second leaf (4) and is pushed through from the back before it reaches the leaf midrib. The right hand guides the point of the pin from the back. The succeeding leaves are added similarly. They continue on the bare rod after passing the ends of the fixation strip. The fixation strip having been fixed itself to the rod, encloses the first strip in a loop and prevents it working out to the left over the end of the rod. Owing to the twist of the two parts of the leaves, those on the right can not slip past the first leaf. The fixation technique is simple, but very important. *g*, The rods range in length from 3 feet upwards. At the right end the last leaf must be prevented from slipping over the end. The leaf (6) has been fixed to the bare rod (2). The last leaf (12) is then doubled over the right end of the rod. A fixation strip (3) is doubled around the end of the rod to enclose the last leaf. The leaves (7) and (8) are then added, and by passing around the fixation strip (3) fix it in position. Leaves are added until the gap indicated by the arrow head is filled in. The last leaf (12) is thus effectively anchored in position and in turn prevents the others from slipping off. (Note the pin 5.) Fresh pieces of midrib are used as the others run short. The sheath ends of the leaves are pushed back to the surface away from the worker. This rougher surface forms the outer surface of the sheet.

Ladders (*atolau* or *apefa'i*) are used to place the higher thatch sheets in position. They are also required for attaching the roof ridging. The name *atolau* (*ato*, to thatch, and *lau*, thatch sheet of sugar cane leaves) shows the association of ladders with thatching. They consist of two long poles with cross rungs like European ladders. They differ, however, in their extreme narrowness. One seen in Manua had an outside measurement of 10 inches across the side poles which left only 4 inches between them. The barefooted Samoan, however, does not push his foot right through to stand on the instep, but rests on the ball of the foot with only the toes through. The rungs are lashed on either side with sennit braid. A ladder seen in Savaii had three poles. The rungs were lashed to each bamboo pole. After fixing one end of the rung, the sennit was carried across to the middle pole without cutting it, and similarly to the third pole. (See Plate I, *B*.)

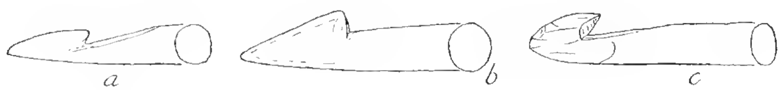


FIGURE 52.—Points of thatching needles: *a*, notch defining the point 0.2 inches deep and cut obliquely outwards to form hook for catching the sennit braid; *b*, straight notch 0.3 inches deep; *c*, oblique notch 0.2 inches deep forming a distinct hook as in *a*. (See Plate III, *A*.)

Thatching needles (*lave lau*) made of any hard wood are used. (See Plate III, *A*.) Notches are made behind the points to form hooks for picking up the braid. The point of interest in the Samoan implements is the round section of some of them, and the shallow nature of the hooks. (See fig. 52.)

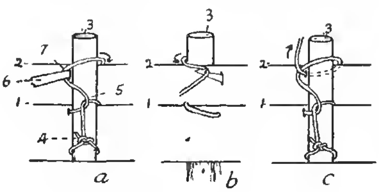


FIGURE 53.—Half-hitch thatching method: *a*, the base line represents the wall plate and (3) the thatch rafter. The line of the upper edge of the first thatch sheet is shown by (1) and the second sheet by (2). The braid is first tied around the thatch rafter with a running noose at (4), then passed over the sheet to the right of the rafter. The needle is thrust through the sheet close below the upper edge on the left of the rafter and hooks the braid through from the outside to pass under itself on the inside. On pulling taut, it forms the half-hitch (5). Details are shown on the second sheet (2). The needle (6) pushes the sennit braid to its left (7) and then passes through the thatch sheet. *b*, The braid end is passed over the sheet on the right and the right hand hooks it over the needle on the outside as shown in the view from the outside. *c*, The needle pulls it through to the inside. The half hitch, already formed, is merely tightened into position on the rafter, as in the first sheet. As each sheet is added higher up the same technique is continued. When the braid runs short, another piece is knotted to it.

The sennit braid used is not coiled into working hanks owing to the whole length having to be pulled through the thatch sheet. There are two methods of fastening: by half stitches (fig. 53), and by overhand knots (fig. 54).

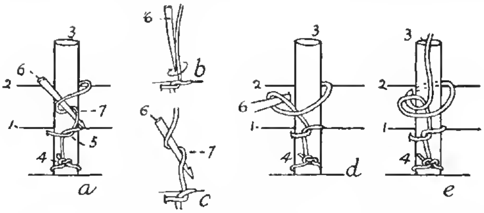


FIGURE 54.—Overhand knot thatching method: *a*, completed knot (5). The needle (6) is twisted around the braid (7) in two movements. *b*, The needle is placed against the left side of the braid and held point downward with the right hand, while the left hand holds the braid taut upwards; *c*, the needle then takes a turn around the braid in the direction of the arrow; *d*, the needle is thrust through the sheet on the left of the rafter; *e*, the braid is hooked over the needle from outside as before and the braid drawn through to the inside. On hauling the braid taut on the rafter, the knot results as shown on the first sheet. This is continued upwards as in the half-hitch method. The preliminary twist with the needle saves much time in making the knot. The method is simple if the side of the braid to which the needle is applied is remembered.

The overhand knot is the firmer method. For rethatching the house, the half hitch method allows the sennit to be easily removed, and thus used again.

The thatch sheets are placed transversely across the thatch rafters (*'aso*) with the rod edge above and the rough surface with the sheath ends to the outside. The first row is attached close to the eave batten. Each row as it proceeds upwards overlaps the preceding row, and thus sheds the rain.

The first few rows are generally very close together. The closest spacing is when the rods of the upper sheets press against those of the lower. This is termed *taolafo* from *tao,* to press down, and *lafo,* the rod material. A slightly wider spacing is where the level of the pin presses against the rod below. This is *taotuaniu* (from *tao,* to press and *tuaniu,* the leaflet midrib sheet pins). These terms, however, are especially used in overlapping the ends of the sheets on the same horizontal row. From the close spacing near the eave batten, the rows gradually space out to two or three inches, and continue so to the roof. The spacing of the sheets depends on the thatch material available. The closer the sheets, the more impermeable the roof to rain, and the longer the life of the roof; the greater also is the quantity required.

The thatchers inside work upwards on the same thatch rafter. Several thatchers have to work together as the lashing goes up on every eighth thatch rafter or so. There may be three men to lash one strip of thatch. The overlap at the ends is also attended to. The upper edges of two adjacent sheets are never on quite the same level, as the rod part is put above or below the other in order to make the necessary overlap ride easily. The men all work on the same row, and the strip or section is carried up to the ridgepole. Handy

(14, p. 9) states that a row from the eaves to the ridge is called an *ue'i lau*. The overlapping of thatch sheets is *fa'asua'i*, and the ends of the sheets where they overlap each other, is *su'euga*, also *ululau*. In commencing another strip or section of thatching, the leaves of the sheets already fastened have to be lifted up to allow the ends of the sheets being added to overlap without confusion.

Thatching paddle. A special paddle-shaped implement (*alai*) is used. Thatching paddle is an appropriate name for it, as ordinary canoe paddles are often used when the special implement is lacking. The typical thatching paddle (*alai*) figured in Plate III, *C*, is made of a heavy wood. The blade is sharp edged, and slopes evenly back to the handle. One surface has slightly more transverse convexity than the other, and is slightly concave longitudinally. The tip is formed into a blunt point by the meeting of the blade's curving side edges. The handle is round in sections and its end is cut off square.

When the first sheet is being placed against its corresponding horizontal row, the blade of the *alai* is inserted under the leaves of the sheet above, between the leaves and the thatch rafters. The leaves are lifted up and the new sheet placed in position with the necessary overlap to the outside of the fixed sheet.

From the method of sticking the *alai* in amongst a mass of leaves already fixed has originated a saying in Manua. A person wishing to intrude with a speech in a gathering of people when it is not his turn according to social etiquette, does so by likening himself to the *alai*. He quotes first as his justification: "O lea tu le alai." (There will stand the thatching paddle.) The respect which Sāmoans have for such figures of speech enables the intruder to unburden his mind.

The ridging is attached after the middle section of the house is completely thatched on both sides. The ridging as a whole is *taualunga*, but the plaited coconut leaf sheets which are used as covers are termed *fa'atafiti*. The *fa'atafiti* sheets are made of single whole coconut leaves and two half leaves, plaited together so that the whole leaf midrib is in the middle line, and the split midrib some inches away on either side. The middle midrib is placed on the upper ridgepole, *'au'au lunga*, and the split midribs hang down on either side parallel with it. Wooden pins are passed through from side to side above the split side midribs and below the upper ridgepole. This is termed *susu'i*. The ends of the sheets are overlapped, and more than one layer may be used. The upper ridgepole thus keeps the ridging pins in position, and the split midribs keep the sheets from working up over the pins. The pins must be long so as to project well on either side. The leaflets from the edges of the roof sheets hang down and overlap the uppermost rows of thatch.

As the framework of the end sections are finished, the thatch is put on

in the way described, but of course there is no ridging. The thatch sheets are worked round to follow the curve of the framework. When closely examined from the inside, the overlapping end rows look somewhat irregular in parts. The general effect however is pleasing owing to the eye being deflected to the curves of the purlins, the regular effect of the parallel thatch rafters, and the evenness of the sennit lashings.

The junction between the middle and end sections is the last part to be thatched. This junction is called the *pepe*. When a house reaches this stage, it is well on its way to completion. In Savaii this stage is called *lau-a-imoa* and is used in conversation to denote the advance made. The origin of the term is described in the following folk tale.

TRADITION OF UNFINISHED THATCH

Alo-maunanae was the son of Nai-saafa, high chief of the Amoa district in Savaii. His mother was Sina-mata-imoa, who had a rat's head. (The term *imoa* means rat.) Alo married Meto-tangi-vale, daughter of Punga, who lived at Leuo between Puapua and Le Alatele. He met her through a dart throwing competition, which is another story.

Owing to Meto's natural importunity for a house after their union, Alo approached his parents. They referred him to Imoa-ita (Savage rat) who, however, refused to act as head builder. Alo thereupon cursed him, saying, "For your discourtesy to me, may you die by the wayside and be trodden underfoot by the passersby." (Dead rats lying by the roadside in Samoa are the result of an ill advised refusal by one of their ancestors.) Imoa-sina (White rat) accepted the commission and commenced building with his rat carpenters. Alo's mother told him he was on no account to move or make a sound in his sleep while the house was being built. The framework of the house was of *toa* (ironwood) and the thatch of *'ula* (red feathers). All was completed except the thatch at the *pepe* junction when Alo moved in his sleep. The startled carpenters immediately left the work. Hence the saying, "*lau-a-imoa*" (the thatch as the rats left it).

In spite of this small omission, the house was evidently a good one for it is quoted in another saying when speaking of a good house, " 'Ua o le fale na i Amoa, e pou i toa, ae lau i'ula." (Like the housei n Amoa, the posts were of ironwood and the thatch of red feathers).

The life of an ordinary roof of cane leaves is 6 to 7 years, but a well-thatched roof, 8 to 10 years. Old thatch is *falu lau*. When the thatch becomes so old that the roof leaks, the house is rethatched (*ulu*). It is often done in sections where the leak occurs, and the roof has a patchy appearance. To thatch over old thatch is *fatu'ulu*.

The last process in thatching is cutting the ends of the leaves level over the eaves (*tuhutulu*). In important houses, the builder came back to do this after the *taufale's* party had completed the thatching. The builders left after the completion of the framework of the second end section. The cutting of the eaves, however, was part of their duty as recited at the final payment feast. The part under the eaves is termed *pa'usisi*.

HOUSE PLATFORMS

In all dwelling houses and guest houses, the floor is raised above the level of the surrounding ground surface. This necessitates the building of a raised platform (*paepae*). Except where the house is built on an old site, the platform and floor are always built after the house is constructed and thatched. The height and extent of the house platform depend on the status of the house. In guest houses, this also depends on the status of the owner. The platform, though built last, came into the master builder's calculations before construction commenced. It has been seen that the main posts of the house were sunk into the ground. The height of the proposed platform had therefore to be added to the height of the main posts. It also affected the level on the rafters to which the wall plates are attached. A completed house that has yet to have a high platform added is a curious sight. It hangs in the air, and emphasizes the peculiarity of Samoan house construction, the somewhat unique principle of hanging the frame from the ridgepole.

The platform material is stone. Exceptions to the stone platform occurred in the uncommon instances where stone material is too difficult to obtain. Such a condition obtains in an old village site on a tableland near Manase, Savaii. This is on Mr. Anunsen's property some distance back from the coast. The house sites are evidenced by flat earth mounds raised a little above the ground level. A well-preserved circular one is 42 by 40 feet in diameter. Around the circumference are nine hollows evenly spaced showing where earth had been scooped up and thrown inwards to form the raised platform. Between the hollows the earth had been sloped upwards to form pathways to the platform. The platform itself is about 2 feet above the surrounding ground level.

The ground is of red earth, unsuitable for cultivation, and containing little stone. Such stone as existed was in the form of smaller pieces that had been used to cover the floor, and had evidently been carried to the site. The tableland is the flat surface of a ridge between two streams. As several trenches ran across the ridge, the village may have been a place of retreat for defence. In places that are not of permanent or long continued occupation there is naturally no incentive to carry stone from long distances to build house platforms.

In another village site on the same property, plenty of stone is present in the ground. The house sites here have the usual stone platforms, but they are not high. Numerous trenches also exist.

In some of the present villages, the stone is transported from fair distances, sometimes by canoes to the nearest point on the beach. At Fangamalo in Savaii, the platforms of two church houses were being built during my stay. Working bees of women and men carried the stone in coconut leaf baskets slung on a pole carried over the shoulders of two. Food was pooled by the

village, and delicacies such as breadfruit *taufolo* were prepared. Cooperation in such matters is marked by gaiety and laughter, which helps the shoulders to bear the strain. Time is of no commercial value, and days are allotted to the task from time to time to prevent too much interference with ordinary routine. It is surprising what a vast quantity of stone can be transported by primitive methods by a large number of people in a long time. I was in Fangamalo for two months and both platforms were far from completion when I left. However, there was no hurry. One thing is certain: the platforms will be completed at some time.

The platforms vary in extent. Some are confined to the immediate boundaries of the house. These are usually low, consisting of one course of stone (*lautasi, lau* meaning depth, and *tasi,* one). The face of the platform is composed of large, even sized stones, but they are not worked in any way. In low platforms, the area outside is covered with smaller stones to form a loose pavement. The shape usually conforms to the sides of the house, but not necessarily so. The outer margins are defined by larger stones forming a continuous line.

In the higher platforms, the house part is made first; it is then occupied and the rest of the platform made later. In the large house at Iva, the stone platform was 6 feet, 6 inches in height from the level ground surface. The house which was 45 feet, 6 inches by 54 feet, 8 inches, had been long in occupation. For about a foot external to the wall posts, the house platform had been completed. There were four sloping approaches of stone from the front, back, and two sides. The sides of the platform between the approaches were perpendicular. The spaces between approaches had to be built up to the same level to complete the platform. The matter was being kept steadily in view. With the higher platforms, the outer part was built into terraces working outward and downward from the house. The terraces varied in width, but each face was sharply defined with larger stones. The extent of these terraces again depended on the quantity of stone readily accessible.

In Tutuila where the village sites are usually rocky, loose stone pavements are characteristic. In Savaii, where villages are mostly on sandy soil near a beach devoid of rock, loose stone pavements are entirely absent. Even the house platforms are little larger than the area of the house. The outer part consists of narrow steps instead of terraces. In the few Savaiian villages where the ground is rocky; such as, Aopo and Tanga, the stones lying about had been arranged into a loose pavement.

It may, therefore, be stated that the stone platform to form a house floor is regarded as a necessity. The outside extensions of the platform into terraces and loose stone pavements are extra embellishments that depend on having stone on the site. The use of stone alone as filling was present in the platforms

seen in construction. It is quite conceivable however that earth faced with stone would be used where stone was not abundant.

The floor was formed by levelling off the upper surface of the platform within the house and covering it with small stones (*'ili'ili*). Here again the floor covering depended on available material. Broken stone with the edges unworn was used. Where waterworn pebbles of basalt were available from streams or beaches, they were preferred. At Fitiuta in Tau, waterworn stones from a distant stream had been carried to floor some of the houses. Others were floored with coral gravel. The larger coral gravel was picked out on the beach and carried up in baskets. It often took some time to get a sufficient quantity. A Samoan woman picking over the coral gravel might remind one of a woman of a higher culture selecting a carpet. At Fangamelo, Savaii, the rounded lava gravel from a fairly distant sea beach was most in favor. In the inland village of Iliili, Tutuila, where neither coral nor waterworn gravel was available, recourse was had to the stones of the candlenut tree. This was the only village where a vegetable product was used, and it seemed the irony of fate that its name of Iliili should be the same as the word for small stones.

The folklore tale that refers to the uncompleted thatch also mentions a curious form of floor covering.

THE TALE OF THE UNFINISHED FLOOR

After the house of Alo-maunanae had been built, his wife Meto desired that it should be floored with *lei* (whale ivory). Again Alo sought his mother, who, exasperated, said, "Ola! Se tama'ita'i e tāngi vale." ("Out upon it! This woman cries for the impossible").

The term *tăngi* is to cry; the *a* is short—*tăngi vale* is to cry like a child, but *tāngi vale* (with the *a* long) is the crying of an adult for something impracticable or impossible. Hence the saying, "Ua a tāngi vale ua ona o 'oe o Meto." ("You cry for the impossible as if you were Meto").

However, Alo was advised to go to his sister's husband, Tingilau, who dwelt at Faleatai in Upolu. He was asked by Tingilau if he preferred the *lei uli* (dark *lei*) or *lei tumau* (lasting *lei*). Alo refused both, and he was given the *lei fanau* (*lei* which reproduces itself) with instructions to paddle straight for home without turning around. On the voyage across to Savaii, Alo twice heard the sound of the *lei* as it split and multiplied behind him. Just off Puapua, he heard it again. Curiosity overcame him, he turned to look, whereupon the *lei* disappeared. Deep down at this spot, white pebbles lying on the bottom of the sea represent the *lei fanau* that never carpeted the floor of Meto, who cried for the impossible.

Some houses have the wall plates rather higher off the floor level than usual owing to the fact that the floor level has not been built up to the level originally intended. Thus Tufele of Tau held that the walls of his long house were too high, and intended to raise his house platform accordingly. This probably accounts for the wall posts of the Ivan house being 7 feet 10 inches high.

The stone platform was often added to by chiefs to celebrate a further marriage. As polygamy was in vogue, the extent and number of stone terraces sometimes, not always, indicated the chief's various matrimonial alliances. Each additional one was a delicate compliment to the new wife. The new wife probably took pleasure in gazing at the other stone terraces that hers had made out of date.

NAMES OF HOUSES

More names are appplied to houses than the types described. This is due to the Samoan usage of attaching qualifying words to the noun to describe material, construction, condition, and use in order to save further description. Thus a *fale 'ulu* is a house made of breadfruit wood, but it conveys no further information to the person unacquainted with Samoan house construction. The Samoan, however, knows that breadfruit is used in important houses; guest houses, and not kitchens or ordinary dwelling houses. Similarly, *faleolamea* means a house made with *olemea* wood, but it is only the fine thatch rafters that are formed of *olamea* rods. The word used depends upon what particular aspect of the house is being discussed. As confusion is likely to occur from the number of names given in Pratt's dictionary, they are here enumerated with others.

The *fale'ulu* and *faleolamea* have been mentioned. A house of any wood that is not breadfruit is a *fale vao*, which name also conveys the idea that it is not a proper guest house. One thatched with coconut leaves regardless of type is a *falelaupola*. In the construction of a *falema'o, ma'o* wood is used. In a *falema'a, ma'a* (stone) is used; such as, Le Fale-o-le-Fee. For pigeon netting, a stone receptacle is built up in which live pigeons may be kept until the fowler is ready to return home. This is also called a *falema'a*.

A *falefa'aafolau* is a house built like an *afolau* (canoe house), and is thus a long house. This name has been shortened to *faleafolau*. The term *faletele* has come to describe the round guest house type. A *falesae*, according to Pratt, (23, p. 123), is quite a good house made of split sticks. The split sticks, however, are confined to the curved main purlins (*fau sasae*) used in dwelling houses. A plastered house is a *falevali* and is modern. A *fale fa'alaufao* is one in which the sides are closed down with thatch.

Condition: A *faleaina* is a house that is inhabited, and a *faleofei* one that has been cleaned and prepared for guests or others. A house strengthened to resist storms (*afā*) is a *faleafa*.

Use: The terms *faleumu, umu, faleuli, tunoa*, and *paito* are all used for cooking houses. Both *faleto'a* and *faletofa* are applied to the house a chief sleeps in. *Falefuitui* is a talking chief's house in which chiefs gather for discussion. A house in which visitors are housed is *faletalimalo*.

A rough house near the beach constructed for fishermen while they are

away from home is a *faleapifaugota*. A *faleseu* is a fowler's house for netting pigeons, of which there are usually four, named according to position: *falemua*, *faleva'ai*, *falematua*, *palalau*, and *fa'alele*. A fowl house is a *falemoa* and *faleui* and *maliunga*, the latrine.

A *faleta* is a carpenter's shed, *falelalauga*, a house used by a number of women to plait fine mats in, and *faleta'a*, a brothel. (See Pratt, 23, p. 124.)

The term *laulautu* is applied to the house on the chief's death, and the house where the mourners gather is a *faleniu*. The *falelauasi*, a house of sandal wood, is figuratively applied to dead chiefs who are to be buried.

The terms *fale'oa* and *faleoloa* (stores), and *falepuipui* (prison), are of modern usage. Small houses that stand at the back of the main house are termed *faleo'o* and *faletua*. *Faleo'o* now implies the ordinary dwelling house, and *faletua*, a latrine.

Figuratively, *faleupolu* applies to the people and particularly the body of talking chiefs who support a high chief; *faletolu*, *falefa*, and *falelima* refer to various unions of villages. There are other usages where *fale* (house) is used in conjunction with another word in a figurative sense.

Churchill (6) incorrectly maintained that the Tui Manua had the only house with a proper name, Faleula. The guest house of Tuitele of Leone, Tutuila, is named Falesau, and the name has a great historical significance. The family also had the traditional house of Laloifi which was built under a chestnut tree as its name implies, to house one of the Malietoas and his retinue. The guest house of Maunga at Pago Pago is named Ngangamoe, and there are others.

SPIRIT HOUSES OR TEMPLES

Stair (33, p. 226) states that some gods or *aitu*, principally war gods, were honored with dwellings called *faleaitu* and also *mālumālu-o-le-aitu*. They were built in the ordinary way, and there was nothing to distinguish them except that they were set apart. The double curve in the roof shown by Stair (33, p. 227) must therefore be an error due to the artist. They were in charge of guardians who were called *va'a-o-taua-o-aitu tau*, which he interprets as warships of the war-gods. They were placed in the principal *malae* of the village, and surrounded by a low fence. Raised stone platforms (*fauua taua*) were associated with them. The buildings were raised by the village. The height and size of the platform varied with the respect in which the god was held. Priests went to their houses to consult the gods. The well-known Fale-o-le Fee was the house of Le Fee, the war god of Aana and Faleata.

STORE HOUSES

There are now no special store houses for food. There seems to be no need for them. Pratt (23, p. 126), however, gives *fata* as a raised house for storing yams. No information was obtained.

HOUSE FURNISHINGS

Shelves. Associated with the woodwork of the house are certain elements which, from their function, may be regarded as shelves. They differ from the accepted idea of shelves in being formed of beams or poles instead of boards. Fairly wide spaces may be present between the wooden elements. The woodwork used as shelves may be divided into three kinds; *talitali, so'a* collar beams, and *fata*.

The *talitali* are two special cross beams lashed horizontally to the main posts of a round house. They are placed about 2 feet below the lower tier of collar beams and run at right angles to the collar beams. Where there is more than one main post they are lashed to each post. (See fig. 55.)

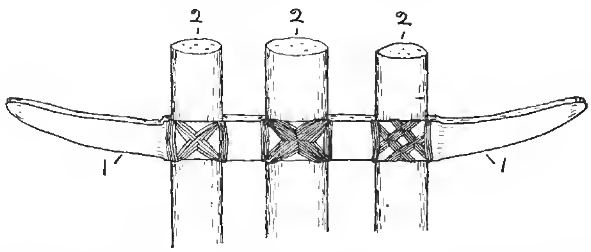


FIGURE 55.—Shelf and hanger (*talitali*): the figure shows the *talitali* (1) lashed to the three main posts (2) of the house of Timu, a talking chief of Safotu in Savaii. The two crossbeams are dubbed out into thick, wide planks extending to the outside edges of the two outer posts and beyond that curving slightly upwards to form blunt points. One is attached on either side of the posts and lashed to each post in much the same manner as two collar beams to a middle main post (figure 31). The lashings form decorative designs on either side of the *talitali* plank and in this figure a different design is associated with each post.

The *talitali* is always attached by the expert builders as part of their contract. The two parallel arms of the *talitali* are used as a shelf on which baskets or other objects are laid transversely. Baskets may also be hung over the pointed ends. Additional *talitali* are sometimes seen higher up on the posts.

The horizontal *so'a* cross beams form important shelves upon which bundles of mats, bark cloth and house property are stored. As three main posts require a set of four collar beams, a shelf at least 6 feet in width is provided. (See fig. 56.)

In long houses, the upper tiers of collar beams may be utilised as a shelf for articles not often required but as they form a rather narrow shelf, it is usual to place two or more longitudinal poles or beams upon them sufficiently spaced apart to form a wider shelf. There is no need to lash them together. More than one set of tiers may be used if the wealth of the family requires it.

The *fata* is a special platform of poles that usually stretches between the

wall plate and the supporting posts. They naturally differ in the round house and the long house from the different position of the supporting posts.

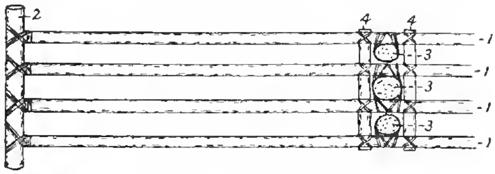


FIGURE 56.—Collar beam shelves—view from underneath: 1, four collar beams lashed at the outer ends to the purlin (2) and the middle to the three main posts (3). The shelf may be improved by lashing a cross piece (4) to the upper surfaces of the beams on either side of the main posts.

In a round house at Fangasa, Tutuila, cross beams rested on the *talitali* at their inner ends and on the wall plate of the back wall at their outer ends. To doubly secure the outer ends, special posts were set on either side of the outer beams. A crossbar that passed beneath the beams was lashed to the two special posts.

In a long house at Safotu, Savaii, the *fata* was made as in figure 57.

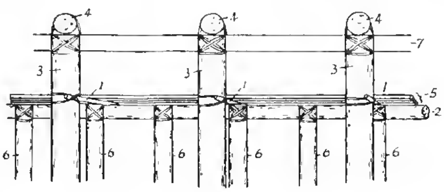


Fig. 57

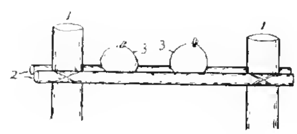


Fig. 58

FIGURE 57.—*Fata* shelf in a long house: 1, short horizontal cross rods; 2, wall plate; 3, supporting posts; 4, tie beams in cross section; 5, longitudinal poles forming the shelf; 6, wall posts; 7, main plate. Short horizontal cross rods are rested at their outer ends on the wall plate while their inner ends are lashed to the supporting posts. Long poles are then rested longitudinally on the cross rods to form the shelf.

FIGURE 58.—Water bottle shelf: 1, wall posts; 2, horizontal poles; 3, coconut shell water containers. Two horizontal poles are tied, one on either side of two wall posts. The space between the poles forms a support for the water containers.

In both types of *fata*, the level was the upper surface of the wall plate and thus within easy reach. The *fata* was used for storing plaited food trays and the articles in everyday use. The *talitali* and *fata* were service shelves whilst the higher collar beam shelves which had to be reached by a ladder were store shelves.

Another special shelf (*sasanga*) was used to support coconut shell water bottles. (See fig. 58.)

For small objects, the upper surface of the wall and curb plates as they slope back to meet the thatch rafters forms a good shelf. Objects are also placed on the top of the wall posts.

Wall screens (*pola*). Dwelling and guest houses are not complete without sets of wall screens which pass completely round the house and can be raised or lowered at will. They are never used with cooking houses.

The screen mats are formed of plaited, half coconut leaves. (See p. 176.) Before plaiting, the leaves are cut so that their length will overlap two wall posts. The plaited depth is a foot or slightly more. Of the two long edges, one is formed by the split leaf midrib and the other by the thick three-ply braid finish of the plaiting. The mats are hung in sets from the wall plate to cover the distance between it and the floor. Allowing for overlap, it takes from six to eight mats to each set, which forms a vertical panel of the width of one mat and covers the space between two wall posts. The mats are supported at their upper edges by two continuous sennit cords spaced equidistant between the middle line and the side edges.

The method of attachment to the wall plate is shown in figure 59.

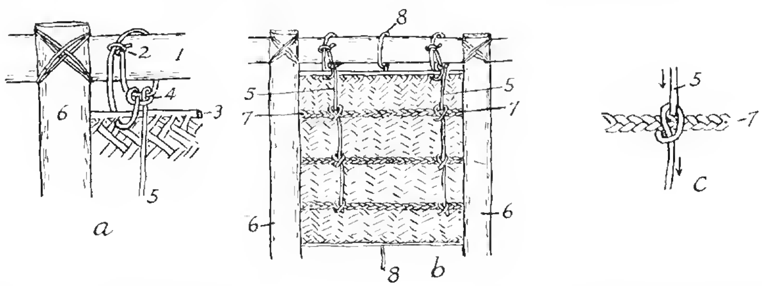


FIGURE 59.—Attachment of wall screens: *a*, view from inside house. The two sennit cords are first tied to the wall plate (1) by the usual running noose commencement (2). The top sheet of the set always has the midrib edge (3) upwards. The braid is passed around the midrib from without in and then tied to its loop around the wall plate by two half hitches which form a clove hitch (4). The figure shows the braid loose, but in actual practice all loops are drawn taut. *b*, With both cords (5) tied, the top sheet is securely slung where the overlap on the two wall posts (6) is seen. The succeeding sheets are attached with their braided edges (7) upwards. The two cords (5) are brought down over the inner surface of the top sheet, passed behind the braided upper edge (7) of the second sheet, and brought through it below the braids from without inwards. The sheet is adjusted to slightly overlap the lower edge of the top sheet which is to the outside of it. The cords are pulled taut to this position and held against the upper edge of the second sheet by the left hand. *c*, The right hand passes the braid around its standing part from right to left behind it, and passes it through the loop formed. The knots are drawn taut, and the sheet secured as in (*b*). The other sheets are attached in the same way. A fourth sheet so attached is shown in the figure. The cord (8) is tied to the wall plate above the middle of the sheet. It is passed outwards above the top sheet so that it hangs down behind the sheets.

The sheets of the panel in figure 59*b* are shown overlapping the two wall posts on their outer side. Thus, as the wind blows in towards the house, the wall screens are let down on that side, and the overlap against the posts prevents them from being blown inside. When let down, the screens form the walls of the house. The closeness of the wall posts is accounted for by the

support they give the screens. Thus they eventually carry out their proper function of supporting side walls even though they be of plaited coconut leaf. The panels are all attached in the same way, and adjusted so that the side edges of contiguous panels have a slight overlap.

To raise the panels, the lowest sheet is lifted from the inside of the house by placing the hands under the lower edge and catching the lower edges of the other sheets behind as it is raised upwards. The middle cord (fig. 59*b*, 8) which is behind, is brought forward under the sheets and looped round its upper end near the wall plate with a couple of half hitches. It may be necessary at times to push out an adjacent panel to clear the overlapping edges. To let down the panel the middle cord is simply unhitched, and the panel straightens out with its own weight.

The adjustable screen panels make the Samoan house eminently suited to the tropics. When there is no strong wind or rain, all the panels are raised. The high thatched roof is much cooler than corrugated iron, and the open walls make them much superior to plank houses in hot weather. As sleeping porches, they are as good, if not better, than those devised by higher cultures.

The plaited screen sheet is called *pola* in general, and *pola sisi* in particular. Sometimes a sheet works loose and falls outside (*tau fafo*). Anything of little importance is idiomatically referred to as a *pola tau fafo,* the screen which drops outside.

Fireplace. Though cooking was done in a separate house, fires were on occasion used in the dwelling and guest houses. A hearth (*ta'ingāfi*) was formed on the floor by imbedding a number of waterworn stones on edge where the shape permitted to enclose a small square or rectangular shallow depression. This was the *ta'ingaafi* (from *ta'i,* to tend, and *afi,* fire), also *avangalafu.*

In houses not occupied for some time, a fire was lighted to clear away any mouldy smell. It was also used for lighting purposes. At a school festival in a guest house on Manua, the pupils, after singing, challenged the visitors to respond. A Samoan teacher sitting beside me said, "The fire is coming over here." This curious phrase was later explained. When visitors were entertained at night, a fire was lighted to illuminate the dances that were given. The fire was toward the part occupied by the performers. When the visitors' turn came to respond in like manner, the fire was shifted to a fireplace in their end of the house in order that their performance might be seen. When the dancing alternated between the two ends, the fire alternated likewise.

Lighting. In addition to the light of a fire, other forms were used that were referred to as *moli,* which has now come to mean a lamp. There are two forms of *moli.*

The term *moli* means coconut oil, but any doubt is prevented by using the term *pôpô* (mature coconut) to qualify it. Coconut oil was prepared from the flesh of the mature nut. The receptacle was formed of the half of a mature coconut with the flesh left in to protect the shell from the heat. The wick of dry coconut leaflet midrib (*tuaniu*) was wrapped round with a strip of thin undyed bark cloth. The midrib end was stuck upright in the flesh at the bottom of the nut.

The expression *moli lama,* is candlenut light. The candlenuts, cooked in small baskets on the leaf covered hot stones of an earth oven, were cracked to extract the kernels. Ten to twelve kernels were threaded on a dry coconut leaflet midrib, and stuck in the ground or bent over a stone or half coconut shell. The end kernel was lighted and the others caught alight in turn. An attendant revolved the midrib from time to time to ensure the nuts burning evenly. Both the candlenut tree and the nut are called *lama*.

Floor mats. Part of the essential equipment is a sufficient number of floor mats to cover the whole floor space. When the guest house is not in use, the mats are rolled up and stacked on the shelves. When a few people enter to rest or talk, sufficient mats are taken down to cover the part that is occupied. The Samoans do not sit on the bare gravel, neither do they usually cover the parts of the floor that are not occupièd. On ceremonial occasions, and when guests occupy the house, the whole floor area is covered.

Floor mats consist of three kinds: *polavai* or *tapa'au,* made of coconut leaf, *papa,* coarse strips of pandanus, and *fala,* narrower strips of a different kind of pandanus.

The *polavai* are laid directly on the coarse gravel floor, and the *papa* and *fala* above them. The *papa* mats are also called *paongo* from the name of the pandanus, and they sometimes take the place of the coconut leaf mats. The *fala* also takes its name from the *fala* pandanus. The manufacture is described under Plaiting.

The mats average about 6 feet in length and 3 feet in width, though larger ones are made. They are spread with the length parallel with the house walls. If a chief wishes to stretch his legs from the cross-legged position strictly demanded by etiquette, he pulls a floor mat over his feet and legs. Such an action prevents a breach of good manners.

The set of mats for a new house is plaited by the women of the chief's family (*ainga*), but on occasion he may get them elsewhere by taking advantage of a curious custom.

MAT COLLECTING

The *tu'u papa* or *tu'u fala* custom is the procedure whereby a chief may collect mats for a new house by asking for them at another village. He usually takes the *taupou* maid of his village, his talking chief, and some young men to carry home the spoil. On entering the village, the *taupou* goes to the house of the women folk, *aua-*

luma, while the others enter the appropriate guest house. The village chiefs gather, and bring *'ava* for the *ingunga* welcoming bowl. When the visiting talking chief replies to the ceremonial greetings, he explains that the visit is a *tu'u papa* to collect mats for the chief's new house. The local chiefs then return to their houses and inform their wives. Meanwhile the visting taupou has also promulgated the object of the visit. The women get together and contribute so many each. A levy of one to two hundred is soon made up and duly presented, gratis, to the visiting chief. He usually stays the night, when a *laulautasi* meal contributed and shared by the local chiefs is given in the evening followed perhaps by dancing as a further expression of hospitality.

The chief thus gets his quota of mats, and the few contributed by each family entails no hardship upon them. Pratt defines *tu'u fala* as going about begging for mats, but this conveys a wrong impression. It is a useful custom still in force, and carries no stigma. The chief gives his neighbors an honorable opportunity of assisting in the furnishing of his new house, and he himself is ready to reciprocate on any future occasion. It is immaterial whether *papa* or *fala* is used with the word *tu'u*. A woman in Savaii who had been much annoyed by parties carrying out the introduced custom of celebrating at the New Year, determined to get something back by counter attacking with the *tu'u fala* custom. Accompanied by her children she made the rounds of the village, and returned home with over fifty floor mats.

Bedding. Inured to the hard floor from childhood, the mass of the people used bedding consisting of a floor mat with a cover of a sheet of bark cloth when needed. The bark cloth has given way to foreign cotton cloth sheets. For chiefs the sleeping mats consist of *fala* with narrower wefts than the floor mat. These are usually plaited with a twill stroke instead of the usual check. Some of these have geometrical designs introduced by using colored elements, but evidence points to this type being introduced. So also is the use of fringes of colored worsted. Sleeping mats are also made of *lau'ie*.

A raised bed termed *ulumoenga* is made by laying mats above each other to a height of a foot or so. Bark cloth is also used to raise the pile. The finer mats are placed above the coarse floor mats. Nowadays, sheets and modern pillows are used to finish off with, but mattresses are rarely used. The use of leaves and grasses under the floor mats has not been in vogue.

Pillows. The pillow of bamboo (*'ali*) is still much used. Thus, a floor mat, a sheet, and an *'ali* serve the majority of the people. The man who uses a raised *ulumoenga* generally has a modern pillow stuffed with kapok which has been introduced throughout the islands. Bamboo is called *'ofe*, the nodes *pona*, and the internodes *upu*. Large bamboo, about 3 inches in diameter, is used for the headrest. The length of the pillow is counted by internodes and ranges from one (*'aliupu tasi*) to several. The ends are always cut off close to the outer side of the end nodes. (See Pl. III, *D*, 2, 3.)

The legs (*vae'ali*) are formed in pairs from the forked branches of some light wood such as *pualulu* that will not split easily. In a typical pair, the legs are about 1 inch in diameter with a spread at their lower ends of 7.75 inches. The upper surface of the upper connecting part is 2 inches wide and is cut concave to fit the curve of the bamboo. In the middle line between the legs, the connecting wood is over an inch deep. The height of the legs is

3.75 inches which makes the total height of the pillow 6.75 inches. According to the wishes of the maker the legs may vary in height to suit him. The lower ends of the legs are cut obliquely to fit level with the ground, and the outer edges are trimmed.

The legs are lashed to the ends of the bamboo with sennit braid. In short pillows the legs are lashed close to the ends just inside the nodal joins whilst in long pillows they are placed much nearer the middle. Two methods of lashing are in vogue: round the circumference of the bamboo (fig. 60), or through a transversely bored hole (fig. 61).

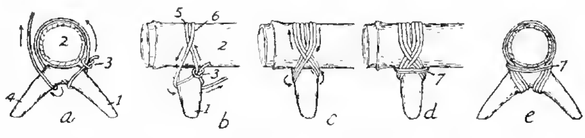


FIGURE 60.—Lashing of pillow legs, circumferential method: 1, near leg; 2, bamboo; 3, commencement knot; 4, far leg; 5, to 7, lashing turns: *a*, end view in which the braid is tied around the leg nearest the operator with a running noose, and passed over the bamboo around the far leg; *b*, side view in which the first turn (5) passes obliquely upward from the right side of the near leg to cross the middle line defined by an imaginary line drawn over the bamboo from the mid points of the legs where they touch the bamboo. After crossing about half way up the side of the bamboo, the braid runs parallel with the left side of the middle line to a similar crossing point on the other side, then it runs obliquely down to the right side of the far leg. The braid (6) passes under the far leg, runs obliquely upwards from its left to cross at the far lateral crossing point, returns on the right side of the middle line parallel with the first turn, recrosses on the near side, and runs obliquely to the left side of the near leg to pass under it to the right when the braid is back to its starting point. Thus, the turns cross the middle line and then recross on the opposite side to pass under the leg on the same side that they started from. *c*, Side view. The following turns follow successively on the outer side of the preceding turns until three turns have been made on either side of the middle line. Care is taken to fit the turns neatly together to form a clear pattern. *d*, Side view. The lashing is finished off by making horizontal turns (7) passing over the previous series and between the two wooden elements to tighten up the lashing in the usual Samoan technique. *e*, End view. The horizontal nature of the finishing turns (7) is shown and the manner in which the first series of turns passed under the legs on either side. The braid is fixed by passing it under the last loose horizontal turn, drawing the turn taut and cutting off the braid. The short end is concealed by tucking it behind the turns.

The circumferential lashing does not prevent the legs from slipping around on the smooth bamboo, but as the other pair can be readily slipped around to the same position, the movement forms no serious objection to the method of lashing. The raised nodes prevent the lashing from working over the ends of the bamboo.

The lashing through holes prevents the legs from slipping round the bamboo, but it does not give such a neat appearance as the circumferential lashing. Probably it is a later development due to greater facilities for boring holes.

The "V" shaped legs of the bamboo pillow supply the "V" or chevron motive in tattooing and carving with the name of *vae'ali*. No corroborative information was obtained concerning the report that live snakes were sometimes confined in bamboo pillows.

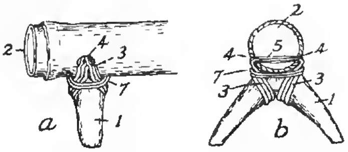


FIGURE 61.—Method of lashing pillow legs through transverse holes: 1, legs; 2, bamboo; 3, first series of turns; 4, hole through bamboo; 5, first series turns passing through bamboo; 7, finishing turns. A hole is bored through both sides of the bamboo on the lashing site at corresponding points less than half way up. Sufficient of the lower segment of the bamboo circumference must be included to give a strong enough support for the lashing. The lashing turns are exactly similar to those of the previous method, but instead of the first series passing over the top of the bamboo, they pass through the holes on the near and far sides of the bamboo. The order of the turns is the same, but no careful overlapping of a decorative nature is possible as the greater length of the turns is concealed in the interior of the bamboo. The method of passing the braid backwards and forwards through the holes is taken from the technique of canoe building. One end of the braid is tied around the near leg. The other end is unravelled, the strands thinned down and then replaited to form a thinner braid, or even two-ply twist. The thin end is caught in the split end of a piece of green, coconut leaflet midrib. The midrib acting as a needle is passed through both holes and the braid drawn through. A long loop is formed by lifting up one strand of the braid in the part that has not passed through the near hole and passing the thin end through under it. The midrib needle is discarded. By manipulating the continuous loop, the braid can be drawn through the holes after the turns are made around the legs. The method obviates the continued use of the needle which is too weak to draw the braid through when the holes become crowded with the previous turns. *a*, Side view, showing the first series of turns (3) and the finishing turns (7); *b*, view of section through the holes showing first series passing around the legs (3) and through the holes (5) and also the finishing series (7).

An Upolu type of pillow made for Mr. Judd by the chieftainess Kalala consists of two sections of bamboo; one superimposed on the other and kept in position by a mesial, longitudinal strip from the lower passing along the cavity of the upper. (See Plate III, *D*, 1.)

Wooden pillows of the Tongan type are in use in Samoa. They were introduced and are not made locally.

People desiring to rest in the daytime call out for an *'ali*. Most Samoans still prefer it to a modern stuffed pillow, as it gives firmer support. The back of the neck is rested upon it. When other people are present, it is bad manners to recline with the feet toward them, or toward the interior of the house. One may rest sitting cross-legged against a wall post, or even stretch out the legs by covering them with a floor mat, but to slip further down into the reclining position is unpardonable. When the pillow is brought, it is turned towards the interior and the feet are thus stretched out towards the wall posts. With this proviso one may doze off and leave the conversation to others with-

out being guilty of rudeness. It is correct, however, to premise the request for the pillow by suggesting a short rest.

Curtains. The rounded end of a guest house is sometimes partitioned off into a sleeping room. A cord or rope is stretched across about six feet above the floor. The ends are tied to convenient parts of the wooden framework. Over the cord a very large piece of bark cloth is hung as a curtain. The term *pupuni* (to shut in or enclose) is also given to the curtain.

Large pieces of bark cloth are specially prepared for curtains (*pupuni*). They are made long enough to extend across the width of the house, and are over six feet in depth to allow a fair overlap over the stretched cord. Nowadays the curtain is pegged to the cord. In all guest houses in which I stayed one end was curtained off to give privacy to the guest. Practically every guest house had a large *pupuni* curtain as a necessary part of its equipment.

Sometimes shorter lengths of cloth (*potu*) are used. Three or four pieces are necessary to shut off the width of the house. The whole combination forms a *pupuni,* but the individual pieces are *potu*. The part of the house screened off as a room is termed *afeafe*.

Mosquito curtains (*ta'inamu*). A tent of bark cloth has been in use from ancient times as a protection against mosquitoes (*namu*). References to *ta'inamu* in old legends prove their age. A large rectangular piece of cloth was doubled over a cord stretched six feet above the ground. The length along the cord had to be sufficient for the length of the occupant, and allow for the edges being sewed together at either end from the cord to the ground. The sewing was done by puncturing holes with a pointed stick and threading some fibrous material through them. The curtain was spread laterally by transverse curved rods passed under the cloth and above the cord. which formed a ridgepole. The material had to be long enough not only to reach the floor all around, but to provide sufficient surplus upon which stones were placed to keep it in close contact with the floor. The curtains were effective but very warm and stuffy. Their use was the lesser of two evils.

The bark cloth *ta'inamu* has completely given away to the introduced trade article, which is in universal use. It is tied to stretched cords, and stones are used to keep the edges down.

Cords and ropes. Sennit braid and twisted or braided cords, or small ropes of *fau* bark, form part of the house furnishing to suspend mosquito curtains or hang clothes on when necessary.

Stones. In addition to the large gravel floor, larger waterworn stones of basalt are always to be found in the houses for use as weights, not only for

mosquito curtains but to keep mats down when there is wind. They are also used in the dwelling houses in one of the processes of bark-cloth making and in plaiting fine mats. From constant handling, these stones become quite shiny. They are by no means an insignificant part of the furnishing.

The floor gravel is also useful for expelling pigs and fowls. Dogs have the freedom of the house, but such missiles are used against them if their behavior needs reprimanding. The affection of a Samoan for his dog is psychological. He will allow it to starve and suffer from curable skin diseases, but he resents anyone throwing a stone at it.

Pegs. Straight or forked sticks are stuck in an upward slanting position into the thatch as pegs (*to'otu*) for use as hangers. They may be tied to the wall plate.

The *tautaunga* is a food-suspending cord protected from rats by a length of bamboo (*'ofe*). (See fig. 62.) The smooth outer surface of the bamboo prevents rats from climbing down the rope. These protectors are hung up in the dwelling house.

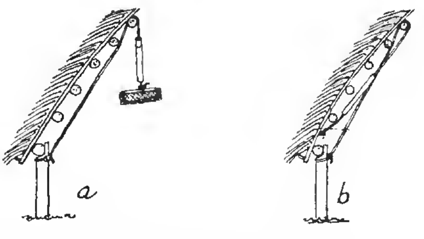


FIGURE 62.—Food protection (*tautaunga*) against rats: *a*, a piece of bamboo about 1 foot long has the nodes pierced and the rope run through. The food basket, parcel, or piece of meat, is tied to the lower end, the other end is passed over a main purlin, the food drawn up, and the rope tied to a part of the woodwork within reach of the floor. *b*, Rope used for drawing against side of roof when *tautaunga* is not in use.

Food. Cooked food purposely left over from a previous meal may be hung up in its basket on the *fata* shelf. The plaited food platters (*laulau*) are kept on the *fata*.

Property. Rolls of floor mats not in use are kept on the supports formed by the lowest set of collar beams in a round house or the *fata* shelves. The property constituting the wealth of a chief, such as fine mats, fibre mats, and bark cloth, is rolled up in bundles (*ta'ui*) with an outer covering of bark cloth and tied with sennit or *fau* rope, and stored, well out of reach, on the upper tiers of collar beams of both long and round houses. This is the only method of storing, as receptacles such as boxes were not used. The wooden boxes cut out of the solid (*tuluma*) now frequently seen in Samoan houses, are an introduction from the Tokelau Islands. The four-cornered, plaited basket of *fala*,

said to be locally developed in technique, was a receptacle for the few articles of apparel in use. The reserve stock, which had to be considerable, owing to the incessant demands of custom, were stored as described. The more tiers that were occupied by the *ta'ui* bundles, the greater the apparent wealth of the family, and the greater their status. While greatly influenced by ceremonial and rank, the Samoan has a very commercial side to his nature, to which food and property strongly appeal. It is openly stated by them that negotiations for a marriage were often commenced by a talking chief for his own chief after seeing the abundance of *ta'ui* bundles displayed on the upper collar beam tiers of the guest house of an unmarried girl's father. The talking chief's own chief might be quite happily married, and have no personal desire for change. The girl might not even know him. Neither of these conditions affected the talking chief. The only thing that influenced him was the plentiful supply of *ta'ui* bundles. Material property came as a marriage gift with the bride to the husband's family. In the distribution which followed, the talking chief, from his official position of chief negotiator, established by custom, received a substantial share. Thus in social organization, the *ta'ui* bundles and the upper collar beam tiers played an important part. The high shelves, in full view of visiting chiefs, not only satisfied the material necessity for storing, but served the equally important psychological need for display. One wonders whether all the bundles contained what their exterior conveyed.

The *tuinga* headdress of human hair, and the feather *'ula*, used with the headdress or as ceremonial kilts, were often stored in a split bamboo receptacle, tied up in bark cloth and hung from the roof like the food protector.

Brooms (*salu*) are made from green coconut leaflet midribs which, on drying, become hard and stiff. The leaflet midribs are first separated from the leaflet by splitting with the thumb nail on either side. The midrib is then torn from the leaf midrib with a sharp jerk which leaves the outer parts of the leaflet still attached to the leaf midrib. The husk of the mature coconut is also used after beating it to loosen up the fibre. Three kinds of *salu* are used.

A hand broom (*salu lima, lima* meaning hand) is formed by merely tying a conveniently sized bundle together near the butt ends. The tied part is held by the hand. An improved form is made by plaiting the butt ends of the midribs together in a three-ply braid. (See Plate III, *B*, 2.) In tearing them from the leaf midrib, thin strips of the leaf midrib are torn off; these enter into the braid. The braid is then neatly rolled on itself to form a convenient bundle of leaflet midribs. The lashing gives a neat finish to the butt end.

A handle (*salu tu*) is added to the hand broom type by arranging the butt ends of the midribs around the end of a stick, and lashing them together. (See Plate III, *B*, 1.)

A spider broom (*salu pungaleveleve—pungalevelevc*, spider) was devised for removing spider webs from the inside of the high roof. One form was made by lengthening the handle of the *salu tu* sufficiently to serve the purpose. A second form was made by using coconut husk fibre instead of leaflet midribs.

The first two forms are used for sweeping the floor and the adjacent surface of the stone platform. Women work very carefully over the floor in the mornings, picking up rubbish and the short fibres discarded from sennit braiding. Even the stones are picked over and replaced. Floor mats are put outside to air in the sun.

PROTECTION OF HOUSES

The weakness of Samoan houses is the join of the rounded ends to the end rafters of the middle section. There is danger that the wind will lift the thatch directly, and take the roof with it. To protect the thatch, heavy coconut leaves are tied together in pairs by their tip ends and straddled over the ridge. They hang down on either side, and by the weight of their midribs help to keep the thatch down. Covering the thatch in this manner is termed *tanufale*. (See Plate I, *D*.)

The danger of the ridging being blown off is guarded against in an additional manner by using the trunks of banana plants. Lengths of these are partly cut through the middle to allow of their being bent over the ridge. The weight is greater than coconut leaves, and a number of them are straddled along the ridge.

To prevent the wind blowing into the house during storms, the *pola* wall screens are reinforced by standing green coconut leaves closely together outside the lowered screens. Ropes are then passed around outside of them and lashed to the wall posts. The leaves may be plaited together. This protection is termed *pālepoi* or *pāletā*.

An additional protection against the wind entering the house and endangering the roof by lifting it off, is by means of a fence (*tali matangi—matangi*, wind). Posts are erected about six feet away on the windward side of the house and a single rail lashed to them. Green coconut leaves are set upright and closely together. They are lashed to the rail and thus form a close wall to break the force of the wind. The fence is higher than the wall plates, and prevents the force of the wind being directed against the weak walls of the house.

TRADITIONAL ORIGIN OF THE SAMOAN HOUSE

The craft of house-building, tradition relates, came direct from the god Tangaloa-matua. The first builders were convened by Tangaloa to consider the construction of a house. The assembly was named Sa Tangaloa (the

family of Tangaloa). The forest was searched for a large tree, from which a post was made and erected in an upright position. Hence it was named *pou tu*. The question of getting a cross-piece mounted on top of the post was discussed. The builder, Manufili, erected two forked posts, placed a cross-bar over them, and then lashed oblique timbers to the main crossbar. With smaller crossbars lashed to the oblique timbers steps were formed up which the ridgepole was carried and placed on the *pou tu*. In compliment to the builder, the scaffolding was named *fata-a-Manufili*, since contracted to *fatamanu*.

The ridgepole was named *'au'au* from *'au'auna* (servant), as the person who suggested it was a servant of Tangaloa. The builders then searched the forest for suitable timber. Breadfruit wood (*'ulu*) was brought in by Malama, and accepted in preference to others. As a reward Tangaloa allowed Malama to use a two-branched thatch rafter (*'aso manga lua*) in buildings erected by him. He also received the kava cup title of *'aso fausia* (the lashed thatch rafter), for the branched rafter was formed by lashing a shorter element to a long one to form the branch. Both Malama and Manufili became *tufunga muamua* (original master builders).

The principal rafters (*fatunga*) were suggested by Malama. The main purlins were proposed by Tangaloa-matua, and hence called *la'au matua* after him. Thatch rafters were made of the breadfruit wood brought in by Malama. Intermediate purlins were proposed by Luanga and received his name. So'a-fa suggested the collar beams. They were thus named *so'a*. Originally there were four (*fa*) to a house. Sauluanga proposed the eave batten. Mata'afa proposed that sennit braid (*'afa*) should be used as lashing. An old song says that the builders from the sky had a discussion as to whether a house or a canoe should be built first. The decision went to the house and hence sennit was first used on a house.

In the rounded ends of the house the curb plate was set up first. The curved purlins (*fau*) were suggested by Malama. The *fau tali 'aso* arch near the ridgepole was the first erected. Then came the middle arch (*fau tu*) with one on either side of it called *fau angai*. The term *angai* means attendant. These *angai* were the original curved purlins, and hence the only ones with distinctive names. Others have since been introduced but have no individual names.

The above story was recited by Le Oso and other talking chiefs of Tutuila. They maintained that originally there was only one post supporting the ridgepole (*pou tu*) and that the house was therefore the *fale tele* (round house). It is difficult with traditions as now related to assess how much of the more recent has been projected into the past. Some days before, I had asked Le Oso if the pandanus leaf (*lau fasa*) had ever been used as thatch. A good deal of discussion took place showing doubt, but finally it was decided

that *lau fasa* had been used in ancient times. During the recital of the above tradition I was informed that the original builders had a long discussion as to whether pandanus leaf or sugar cane leaf should be used as thatch. I could not help thinking that, though my name had not been mentioned among those at the original meeting of carpenters, my question of a few days previous had been referred back by Le Oso to that august assembly, and his own doubt was expressed by the discussion that he alleged had taken place.

A matter-of-fact master builder in Manua expressed the opinion that the first house was a long house, and that the arched purlins used by the Sa Tangaloa were the one-piece split variety (*fau sasae*). From the review made of Samoan building technique, his contention is the more probable. Even if the craft entered Samoa from beyond the horizon (*langi*) with the principles of technique already established, the Manuan builders' theory is the more rational sequence of evolution, no matter where it took place.

The Samoan tendency to rationalize, as seen in their explanation of the names of their islands by identifying them with pairs of ancestors, is present in the Tutuilan tradition of the naming of the parts of the framework of the house. So'a-fa and Luanga are used in this convenient manner to give names to the collar beams and intermediate purlins. Yet such prominent builders disappeared without being perpetuated in the name of a building society. In addition, Luanga is so unknown in Savaii that the intermediate purlins are called *pae'aso*.

The first house built on earth by the Sa Tangaloa was named Faleula. Its site is to be seen at Fanga on the island of Tau in the Manuan group.

GUILD OF BUILDERS

The builders were called *tufunga* in general and *tufunga fai fale* in particular. In Savaii, a carpenter was also called *poua*. Besides houses, they built the better classes of canoes. As the houses were held to have been derived from the first house built by the group organized by Tangaloa, so the builders themselves derived their origin as craftsmen from the first group known as the Sa Tangaloa. The original group has widened out into what Handy (14, p. 15) has termed a carpenters' guild, claiming chiefly origin. All builders belong to the guild of Sa Tangaloa.

Within the guild itself, smaller groups or societies were formed who claimed origin from individual members of the original Sa Tangaloa. Originally they were direct members of his family (*ainga*). They became associated with particular high chiefs, and were thus called *angai o tupu* (the companions of kings). With increasing population and the wider spread of demands for expert housebuilding, the smaller societies increased in membership and spread from the immediate local association with particular chiefs to various villages throughout entire districts. The blood tie became practically

lost, but was theoretically maintained by admission into the family (*ainga*). In Samoan social organization in general, the blood tie weakened, and selection and election to various positions strengthened. Of the builders' societies within the guild, only one carries the name of a builder who figured prominently at the building of the first house. This is the *ainga* of Le Malama on the island of Tutuila. Manu fili, Luanga, and So'a-fa, who gave their names to parts of the building frame, were not further immortalized in building societies, while Sao, To, Le Ifi, Moe, Solofuti, Singi, and Tangavai-lenga, after whom societies are named, were not enumerated in the historic first gathering. It would seem likely, therefore, that as the craft spread societies were formed in other islands of the group that adopted ancestral patrons who were held to have figured in the original Sa Tangaloa. These societies became associated with particular districts, so that the whole group of islands was served. The names and districts obtained were as follows:

Ainga sa Sao—Manua
Ainga sa Le Malama—Tutuila
Ainga sa To—Tutuila
Ainga sa Le Ifi—Upolu, Atua
Ainga sa Moe—Upolu, Aana
Ainga sa Longo—Upolu
Ainga sa Solofuti—Savaii
Ainga sa Singi—Savaii
Ainga sa Tangavai-lenga—Savaii

Handy (14, p. 15) states that there are four major societies, of which Solofuti and Longo are the two most important. This, presumably, is for western Samoa, but in eastern Samoa the *ainga* of Le Malama and Sao give place to none in their respective districts.

The young men are apprenticed to experienced builders, who are generally relatives. Thus they join the Society of the district in which they live. When they become expert they are admitted to full rank within the Society. Handy (14, p. 16) states that an important gathering is held to celebrate this admission of a new member. These gatherings take the form of a feast with ceremonial kava drinking, and the presentation of mats by the graduate to his instructor. The food is provided by the family of the newly elected member. This follows the usual Samoan custom of ceremonial feasting when a person is elected to the position of *matai* or chief. The new *matai* cannot take his official position in the ceremonial kava drinking in his own village or elsewhere until the election made by his family is publicly notified and ratified by a meeting of the chiefs of the village. The new *matai* takes his place against one of the posts of the round guest house. Speeches are made, and his title name is called with his cup of kava. From then on he is publicly recognized and known by his new title name.

A relative, or someone with sufficient confidence in the new builder, gives him a commission to build a house. In such a construction, he takes the position of head builder (*latu*). He appoints his assistants from his own

society. On the building he demonstrates his ability. By it he is judged by other prospective owners. There is thus the ever-present incentive not only to improve in technique but also to add something novel that will appeal to the public. When some variations were observed in houses I was informed that it was some particular builder's idea to make his house better than others, and thus get more to build. This spirit of competition probably has assisted largely in the evolution of the present round guest house.

Men of rank go into the builders' profession. In the Society they also hold their own rank in the outside world. The head builder in a contract is supreme head of his party. He is referred to ceremonially under three titles. He is the direct representative of the Sa Tangaloa, the companion of kings (*angai o Tupu*), and the personification of the ancestral head of his society group within the wider guild. If he belongs to the society of Sao, when he receives his cup of kava, the three titles are Sa Tangaloa, Angai o Tupu, Ainga sa Sao. He has an official talking chief (*tulafale*) to represent him in the ceremonial speeches and receiving of food and presents. The *tulafale* selected usually holds that rank in civil life. At one of the ceremonial feasts I attended, the *taufale* who made a speech was both talking chief and high chief. His rank was much higher than that of the builders' official talking chief. The builders, however, had in their party a man of very high rank, and he was selected to reply in place of the official talking chief of lesser rank.

SOCIETY TRADE MARKS

Handy (14, p. 17) states that the different societies had some distinctive form of lashing that served to distinguish the buildings made by them. Some of them also used a mark or technical detail in the woodwork. (See fig. 63.) The ainga sa Le Malama used the forked thatch rafter (*'aso manga lua*) that tradition states was personally conferred on Le Malama by Tangaloa. The trade mark was pointed out to me in a house at Nua, Tutuila. Lashing with sennit (fig. 63*a*) forms an *'aso fausia*. Hence the *kava* cup title of Le Malama and his representatives in subsequent ceremonial was 'Aso fausia. The *'aso manga lua* is represented in more modern times by the two thatch rafters cut out of one piece of wood. Two were noted at Aunu'u Island and Vaitongi, Tutuila.

The trade mark of Sao, said to be a star (*fetu*), was placed on the *moamoa* piece at the end of the ridgepole. Search for it proved vain in the Sao houses examined. A builder using the trade mark of another society was reported to the guild. The matter was discussed and the offending member fined.

CONTRACTS

A chief, seeing his way clear to assemble material, food, and gifts, sought out the services of a skilled house builder (*tufuga fai fale*). The builder

was more than carpenter; he was architect as well. Thus "builder" is a more descriptive term of the functions and status of the *tufuga* than "carpenter." In selecting a builder, the chief considered his architectural qualifications as well as his manual ability. By accepting a contract directly from the chief, the builder became the head builder (*latu*) in the construction of the house. He employed the necessary number of skilled assistants from his own guild of builders and his authority was supreme. The homebuilder, or person desirous of a house, was the *taufale* and such he remained until the completion of, and payment for, the building. As he is constantly referred to in construction and ceremonial, the word *taufale* will be used for want of an exact expression in English that is free from confusion.

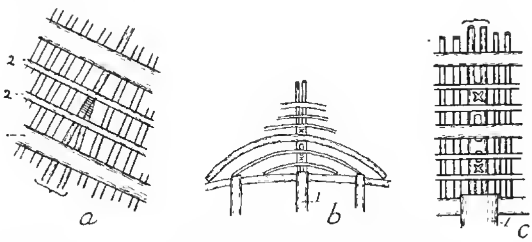


FIGURE 63.—Mark of Le Malama guild of builders (*'aso manga lua*): *a*, the forked rafter was seen in the right, rounded end section not far from the junction with the middle section, and was placed above the middle arch (1) between two intermediate purlins (2). The short limb on the right had been cut at a slant and lashed to the full length rafter on the left. The short limb was spaced to the proper distance and then run down parallel with the other to the curb plate as an ordinary rafter. *b*, Shows the lower ends of the middle thatch rafters finished off with a length in which two rafters were cut out of one piece with wooden connections left between them. The double rafter passed directly over the middle wall post of the right end section. *c*, Shows details of (*b*). On the lower solid part, two rectangular pieces had been cut out leaving three cross connections between the two rafters. On the upper and lower cross pieces, stars with four points had been cut out, but they have no significance beyond ornamentation of a modern type.

The *taufale*, on making his request to the builder, was asked, not whether the house was to be a *fale afolau* (long house) or a *fale tele* (round house), but whether it was to have *utupoto* (tie beams) or *so'a* (collar beams). Though *so'a* are used in the long house, in this question it is used in contradistinction to *utupoto* to indicate a round house which has no *utupoto*. The *taufale* having replied, the builder asked, "How many?" The reply indicated the size of the house. The builder made a mental estimation of the labor involved and probably sized up the ability of the *taufale* to carry out his side of the contract. If his decision was favorable he accepted the gift of a fine mat (*'oloa*) and the preliminary contract was thus sealed by a deposit. Nowadays its place may be taken by a preliminary deposit of ten dollars or two pounds sterling. Before building operations commenced, both parties met over the inevitable bowl of kava. The contract was orally recited and agreed

to. There are two forms of contract; the ordinary one, and the *fale angai* contract.

The ordinary contract terms were recited to me by Nua of Tau, a master builder of the Ainga sa Sao.

The *taufale* and builder agree to become one family (*feangainga*) and live together in love and harmony during the construction of the house. The builder agrees to do everything he can to meet the desires of the *taufale*. The *taufale* agrees on his side to respect the laws and observances of the Sa Tangaloa. The question of material, transport to site, thatch, building the scaffolding, completion of the wall posts, and construction of the floor as part of the *taufale's* side of the contract has become so established that they are not necessarily enumerated. The *taufale* must feed all the builders engaged on the work. When the food is cooked in the oven, that for the builders must be put in separate baskets. It must never be mixed with that for the *taufale's* party attending to the builders and taking an interest in the work. Absence for any time is regarded as neglect and may lead to the builders abandoning the work. The attendant brings water, drinking nuts, and brews kava. In bringing food, the builders must be served first. After the building has commenced the *taufale* must not give food, bark cloth, or fine mats to anyone other than the builders. If any of the family or friends of the *taufale* visit him ceremonially, permission must first be obtained from the builders before he can give even food to them. If given without consulting the builders, the action is regarded as a lack of respect, and they abandon the work. In ceremonial drinking of kava between the two parties the head builder is served with the first cup, and his three titles are called. In all speeches he is addressed by the same titles.

On his side, the builder promises to treat the *taufale* with all respect. He also calls the *taufale* by three titles in speeches and kava drinking. Ali'i Fai'oa (Chief of the Working Family), Taufale Ali'i (Chief of the House that is Being Built), and Ali'i Autapua'i (Chief of the Village). By mutually observing these titles, they place one another on the highest ceremonial plane. When eating in a house, if the builder's son comes to the outside of the house, the builder may give him a share of food wrapped up in leaves or in a basket. The boy must take the food home without opening the parcel. To open it at once to see what sort of food it contained would be lack of respect to the *taufale*. A builder must not call from the scaffolding for anything below. He must come down for it himself. He can not use an adz on the framework. All fitting of timbers must be done in the shed or on the ground. All thatch rafters must be joined and lashed on the ground. No piece can be joined onto the thatch rafter once it has been raised to the oblique position on the frame. This does not apply, of course, to the arches. The builders must not eat or drink standing.

When the families of the *taufale* and builders visit the building ceremonially they bring presents of food such as pigs, *talo,* and kava. Their offerings (*tautunga*) are brought alternately. This alternate order is maintained until the house is finished.

The *fale angai* contract is strict. In the ordinary form of agreement, it will be seen that the *taufale* is in a fairly helpless position. He has to rely on the chief builder's sense of honor and that of his assistants. If he sees inferior work, he can not complain. To do so would show lack of respect to the builder who would leave the work.

To give the *taufale* a direct voice in the work, the *fale angai* agreement can be entered into. The *taufale* then has the right to directly watch the work and draw attention to any slovenly technique. He can tell the head builder

exactly what he wants. If he does not approve of the lashing patterns or the lack of neatness of the turns, he can draw the head builder's attention to them. He can insist on the right timber being used, such as breadfruit wood for the thatch rafters. Any slovenly or poor work he can condemn and have rectified.

The head builder on his side sees that the wishes of the *taufale* are carried out and any mistakes rectified. But to do this he demands a higher standard of living. The food must be of the best and pork must figure more frequently. The family of a *taufale* are kept busy procuring fish and other foods. The builders will eat no cold food, so fresh ovens have to be made. They will drink no water, so baskets of drinking nuts must be ever on hand with an alert attendant ready to supply their demands. The prohibition of the *taufale* giving anything away is rendered doubly strict.

In the strict *fale angai* contract there is no trusting to honor, and no sentiment. The elimination of the sentiment of relationship is difficult to carry out, but is usually obviated by employing a head builder from some other village or district who has no blood tie with the *taufale*. The *taufale* gets a good house if his finances can stand the extra drain. At the finish of the work a higher rate of reward is expected than under the ordinary contract. If the *taufale* fails during the building to satisfy the demands of the builders, they have no hesitation in leaving the work, for in the *fale angai* there is no blood tie and no sentiment of forbearance. Each side is out to get the most it can. Before leaving on strike, the builders leave a sign in the house that acts as a warning to the entire guild. The Sa Tangaloa tapu the *taufale* and no other builders will complete the house. The only chance the *taufale* has of getting his house completed is to humble himself before the head builder with a substantial present of fine mats, and with the use of much ceremonial speech persuade him to resume work. The position is on a par with a civilized industrial strike for increase of wages. In Samoa, however, the strikers are in a more entrenched position than their trade union compatriots.

In a great number of villages throughout eastern and western Samoa, round houses are to be seen with one end section uncompleted. These are termed *fale tala mutu*. The open end of the middle section is closed with thatch and the house occupied as a dwelling. These are witnesses to the fact that the *taufale's* supply of food and material ran short, and that he was unable to have the building completed. He and his family usually wait until they have grown more pigs and planted extra crops. Material is again assembled and the builder reengaged to finish the work. I noticed a few *fale tala mutu* on Olosenga and asked a master builder if the supply of pigs had run short on the island. He laughed so heartly that it admitted his reply.

Occasionally the end section is completed by a different head builder. In a house at Taputimu, Tutuila, one end section was slightly different to the

other. (See fig. 64.) On drawing attention to it, I was informed that this *tala* end section was completed by a different builder. He used the rod to mark off his work from the rest of the building. His work was much neater; he had used this device to draw attention to it and to thus advertise himself.

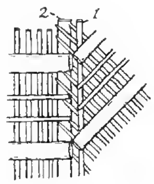


FIGURE 64.—End section *tala* showing change of builder: 1, thin rod running parallel with outer edge of end rafters (2).

FEASTS

The building of an important house is accompanied by a number of set feasts. The food is provided by the *taufale* and his family. In the most important ones, the village assists with food. To be quite clear on this question, it must be remembered that in a large village there are a number of distinct families. These families may trace descent to a common ancester, but it is so far back that close connection is lost. The smaller groups connected by more recent blood ties are termed *ainga*. A chief may be senior in the village, exercise influence and have his position recognized in many practical ways. It is, however, to his own immediate family or *ainga*, consisting of brothers, uncles, sons, nephews and cousins, that he looks for sustained assistance during the building operations. They form the *fai'oa* (working family) from which the *taufale* gets the kava cup title of Ali'i Fai'oa. In an important feast the villagers outside of the *taufale's* immediate *ainga* recognize his position in the village, and their own kinship with him by bringing food contributions to the feast. They are here termed *autapua'i* and it is from the relationship of the *taufale* to them that he gets the kava cup title of Ali'i Autapua'i (Chief of the Villagers). Hence his kava cup titles have a direct bearing on the building operations, and they are used only for that period. The title of Ali'i Taufale (Chief Desiring a House) naturally lapses when his desire is realized. The title of Ali'i Fai'oa ceases when the work for which the family was mobilized is accomplished. The term Ali'i Autapua'i can not be used to express a specific relationship with the villagers after the special need that called it into operation has been satisfied.

The villagers themselves are happy to share in the festivities. Food ceremonies appeal to them especially as they get a share of the food. As far as they are concerned, the feast is like a picnic in which all the food is pooled and then redistributed. They often get better than they brought. It was admitted by my informants that they were not unaware of this. As one expressed it, a

man brings a tin of salmon as a bait with which to catch a large piece of pork. The *taufale* gets little real assistance from the villagers as they practically get back what they bring. The whole thing is a *fa'aaloalo* (a ceremonial way of exhibiting in public their respect for the chief). It also forms a basis for the ceremonial speeches that add to the importance of the occasion. From this ceremonial observance the *taufale* gets psychological satisfaction, which balances the material obligations. The burden of supplying the food for the builders must fall upon him and his immediate *ainga*.

CEREMONY OF RAISING POSTS

A most important feast takes place at the commencement of the work, when the main posts have been erected. I was fortunate enough to attend the feast connected with Misa's house at Ofu. The erection of the posts is termed *fa'atunga,* and the feast receives the same name. The day is arranged beforehand to permit of food preparations. We travelled from the island of Tau to be present on the day appointed.

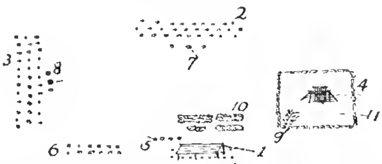


FIGURE 65.—Positions at *fa'atunga* feast: 1, carpenter's shed with working builders; 2, house family; 3, villagers; 4, main posts and scaffolding of new house; 5, talking chiefs of builders; 6, visiting builders; 7, Misa, owner and talking chief; 8, talking chiefs of villagers; 9, pile of green kava; 10, rows of presented food.

The *fa'atunga* ceremony includes the actual erection of the posts and three meals, *lavata'i, fa'atunga,* and *fui'ava.* The *lavata'i* is an early morning meal cooked by one member of the *taufale's* family. He lights the fire, prepares and cooks the food unaided. There must be no noise of interruption. When ready, the meal is conveyed by him to the chief builder and his party, before they commence work. The *lavata'i* is a meal and not a feast.

After the meal the routine work of preparation is proceeded with. The three main posts are already placed in the open holes. The scaffolding has been erected. Towards noon, the posts are set perpendicular and rammed with the top ends level. The ridgepole is placed in position. By this time, the people begin to take up their positions; so the builders retire to their open shed. (See fig. 65.)

One side was formed by the working builders (Sa Tangaloa) in their shed, and the visiting builders on their left. Opposite was the *taufale* family (*fai'oa*). The left side was formed by the villagers (*autapua'i*). The open right side held the newly erected main posts set on the low stone platform of

a previous house. To the left front of the carpenter's shed sat three talking chiefs representing the Sa Tangaloa. The working builders had their hair limed for the occasion. The visiting builders (*tufunga usu*) consisted of those not employed on the building. All master builders within hail had no need to wait for a summons to attend the ceremony; it was their privilege as fellow craftsmen of the Sa Tangaloa to share in the food. Thus, they occupied the same side of the square as their working brethren. Their official title of Tufunga Usu means, "the builders who have come."

The *taufale* family sat in rows with the chief Misa and two others forming a front row. The villagers also sat in level rows with their highest talking chief occupying the middle of the front row. As the working builders were from Tau, whence District Governor Tufele and myself had just come, we were regarded as of their *ainga* and invited to sit in the carpenters' shed. The whole assembly sat cross-legged on the sandy soil, with trees affording shade and setting to a picturesque scene.

The ceremonial was heralded by the characteristic Samoan yell (*ailao*) which came from behind the trees at the back of the *taufale* lines. Young men appeared carrying huge roots of green kava slung from poles and still bearing branches and leaves. The presentation of green kava (*'ava mata*) is the highest honor that can be paid to chiefs and is thus an appropriate tribute to the guild descended from the gods. About a dozen such roots were carried across the central space and deposited on the stone platform on the right. Then came the carriers of baskets of cooked food which were piled up in rows before the builders' shed. Accompanying them was a huge pig cooked whole, and others of smaller size. Several kegs of salt beef furnished a modern note. The food laid out in a lavish heap was fitting recognition of the *angai o tupu* (the companions of kings).

Then Misa, the chief of the *fai'oa*, *taufale*, and *autapua'i*, addressed the descendants of Sao. Misa is one of the rare combinations of high chief and high talking chief termed Ali'i taufale. In his capacity as *taufale* he spoke for himself as *ali'i*. The speech was delivered from the sitting position. The titles of the head builder were enumerated with punctilious ceremony and the greatness of the Sa Tangaloa done justice to. Apologies were made for the paucity and poor quality of the food placed before such an august assembly. The hope was expressed in terms of the contract that nothing would mar the brotherly relationship established between the two parties. Cooperation between them would result in a building that would bring joy to the owner and honor to the builder. Ceremonial phrases and ancient proverbs were repeated at length. A masterly exposition of Samoan oratory concluded with a modern invocation for a blessing on those assembled.

One of the three talking chiefs named Nua had the privilege of reply, as he was the highest ranking chief of the Sa Tangaloa. The head builder

named. Vivao sat silent within the shed, as custom dictated. Misa's titles were named; his generosity extolled. Here Misa made a ceremonial interruption. He deprecated the speaker's allusion as it focussed attention on the paucity of food provided by so large a family and filled them with shame. From the earnestness of his manner I almost forgot that he was adding to his prestige by assuming a humility that was purely ceremonial. Nua completed his remarks with further appropriate superlatives. The other two talking chiefs followed in a similar strain.

The village then took up the oratory. Their talking chief, Lia, was of the high rank termed *to'oto'o*. He had been a London Missionary Society's native pastor, but had resigned to take the title and duties of *to'oto'o* when the vacant title claimed him. He repeated the honorary titles of the Sa Tangaloa, and demonstrated his qualifications for his position of chief orator of the village. When he concluded, the villagers brought forward their contribution of cooked pigs, kegs of beef and baskets of cooked food. As they were added to the pile in front of the shed, a lesser talking chief of the villagers treated them in the *laulautasi* method. The contents of each basket with the name of the giver was announced. He then handed it over to a receiving talking chief of the builders who placed it in the rows he was arranging with obvious satisfaction. While the baskets were being enumerated, the villagers brought the large dried roots of kava (*tungase*) and laid them on the ground before another receiving chief. The talking chief who received the food rearranged the pile. He then replied to the speech of the village and enumerated the articles of food to stress their quality, quantity, and variety. He spoke standing amidst the food. The third talking chief then asked the villagers to excuse them while they divided up the food.

The pigs were quickly cut up and the food divided into heaps under the direction of the talking chiefs. It is for occasions such as this that professional talking chiefs are appointed by the builders. They have to have quick judgment as to the quantity of food, and the number of people to be supplied. If any party gets less than they think they are justly entitled to, no hesitation is evinced in showing their dissatisfaction. As a protest a party may refuse to accept the share allotted to them. Such action shames the builders, who know that public opinion will condemn them as parsimonious. The food was divided up into large portions for the house family, the villagers, the visiting builders, and the Fale Tolu (ceremonial title applied to the village of Tau as represented by our boat crew). Smaller special subdivisions were set aside for the local pastor, District Governor Tufele, and myself. The green and dried kava were also divided up among the heaps. The various articles were arranged by men working under the direction of the officiating talking chief. The division complete, the talking chief retailed the quantities in the various heaps and his assistants quickly carried them over

to their respective groups. My share was carried up to our guest house, where it joined the general house supply. However, I had been publicly acknowledged, which is what most of the world seeks.

A ceremonial complication now seemed to take place. The villagers sent back a keg of beef to the builders. The Sa Tangaloa were immediately on the alert. The officiating talking chief demanded an explanation of their sign of dissatisfaction with the division of the food. He sent the keg of beef back without waiting the reply. The village talking chief replied that the portion had been returned not as an indication of parsimony, but of excessive liberality. The portion of the Sa Tangaloa had been depleted too much in their liberality to others. Once again the keg of beef traveled across the open space, and was hurled down beside the food heap of the Sa Tangaloa. The builders' talking chief called, "That being so let the surface of your minds be unruffled like a calm sea (Ia malu le vai o lou finangalo); we are the best judges as to whether we have been too liberal." He waved his hand towards the keg. One of his assistants picked it up, carried it across the open space and hurled it down beside the villagers' food pile. On this pile reposed the head of the large pig. The village talking chief, not to be outdone in spectacular liberality, waved his hand in turn towards the keg. As it recrossed the open space he called, "Enough, keep it. If you persist in arguing we will send the head of the pig over to join it." This ceremonial threat settled the argument. Honor on both sides was satisfied. The different groups set to work and divided up their shares into individual portions. This done they feasted where they sat. The *fa'atunga* feast was on.

The *fui'ava* is the ordinary evening meal preceded by ceremonial kava drinking (*fui'ava a tufunga*). It is here that the first cup of kava to the head builder with the reciting of his titles, gets full display. It forms a ceremonial ending to the day's proceedings with full accentuation of the prestige and status of the building craft. Unfortunately the full ceremony was abandoned owing to another ceremonial complication that had occurred. This, however, merits description as a further example of the Samoan psychology expressed in custom.

When I arrived the stage was set in groups as before. In front and to the side of the village talking chiefs, a man sat cross-legged with a fine mat spread out over his knees. The talking chief was apologizing to the Sa Tangaloa. One of the older builders with a show of indignation explained to me that the Sa Tangaloa had been insulted. The village orator went on to say that the incident was quite accidental. Everyone, most of all the villagers, knew the high traditional origin and the present prestige of the builders. He begged them to forgive the accident and not let it interfere with the smooth building of the house; to let the surface of their minds remain unruffled. The old builder here informed me that in olden

times the Sa Tangaloa would have immediately embarked in their canoes and gone home. His voice quavered with emotion.

"What was the trouble?" I asked.

"It was terrible," he replied.

Here the builders' talking chief replied, pointing out that such things were not done. However, as he had their assurance that the incident was purely accidental, the builders were inclined to overlook it in their generosity of heart. They were the descendants of gods, the companions of kings and the family of Sao. Nothing of like nature must occur again or they would not be so lenient. The village apologist redoubled his protestations. The bearer of the fine mat rose to his feet, advanced across the plaza and laid the mat before the Sa Tangaloa. It was the self-inflicted fine of the village, and a recompense for guilt. Such having been publicly made manifest, the honor of the builders was satisfied. The mat was accepted and the incident closed. During this time Misa sat silent in his lines. He had personally made his apologies during the whole afternoon. The speeches took so long that the shades of evening were fast falling and the kava ceremonial was abandoned.

"What was the incident?" again I asked the old builder.

"Well," he replied touching his throat, "among the fowls that were in our share there was one that did not have this taken out."

A psychical storm requiring two hours of oratory and a fine mat to calm, had been produced by a careless cook not removing the crop of one fowl. I smiled.

"Would you eat it?" asked the old builder.

"Certainly not," I replied indignantly.

"Neither would the Sa Tangaloa," he said.

A seeming triviality endangered the building of the largest guest house in Manua. Analysis reveals, however, that an important principle was involved. The prestige of the Sa Tangaloa was at stake. An introduced foreign culture is gradually undermining the foundations of the guild. To overlook and thus condone an infringement of their rules, trivial in act but important in principle, would open the way for other infringements, and bring the social side of the edifice toppling to the ground. The guild had my sympathy. At the same time, it was a pity that the uncropped fowl had fallen to the share of the only group to which it could have made a difference.

Between the erection of the main posts and the completion of the house, a number of lesser feasts take place. They are celebrations of the completion of various stages. One such feast takes place on the erection of the middle arch (*fau tu*) of the rounded end.

THE FINAL FEAST

The final feast (*fa'aumatanga*) takes place on the completion of the woodwork of the second rounded end section. The payment for the construction is collected in fine mats, bark cloth, and in these days, money. Pigs and other food are cooked in quantity. The house family, villagers and visiting builders collect as before. The pile of mats is placed in front of the *taufale* and his talking chief. The oven in which the food is cooked is termed *umu sa tele*. The food (*suavai*) from the *umu sa tele* is presented with the usual ceremonial. Fine mats are presented and in ceremonial language the following reasons for the presentation are enumerated: *lima la vevea* (the hands that were cut in the work); *mata pa'ia* (the eyes that were injured by chips); *tafalenga* (the labor done in the house); *tavaonga* (the work done in the forest—*vao*); *o fanau o tufunga ua fafasi e fanau o taufale* (the children of the builders who were beaten by the children of the owner); *salanga o le tulutulu* (the cutting of the thatch at the eaves).

The above language is ceremonial, which deals in superlatives. The more superlatives used, the greater the respect publicly shown to the builders. They did no work in the forest except look for suitable timber and indicate it to the workers. The cutting of eaves, though mentioned, cannot be done until the house family complete the thatching. One or more builders return for this purpose. On that day they are fed by the *taufale*. The food is distributed among the groups by the builders' talking chief. The visiting builders must be carefully attended to in order that each gets adequate and equal shares of the food. The fine mats and cloth are taken away by the builders to their own lodging house, and there divided among themselves.

CEREMONIAL POSITIONS

Within the round guest house there are set positions to be occupied by the chiefs on all ceremonial occasions. The two rounded ends are the places of honor: entering from the front, that on the right is occupied by the village chiefs; that on the left by the visitors. The middle end posts serve as back rests for the chiefs of highest rank on either side. The lesser chiefs range on either side, and each selects a wall post. Thus the middle end posts are often distinguished in some manner. It may be larger in size, carved, or with a more elaborate sennit design on the lashing to the curb plate. Two posts may be close together, or smaller posts may be close to the middle one, one on either side.

Usually the *itu* (middle section) has three wall posts. The principal visiting talking chief sits by the middle one on the front side (*luma*). His colleagues sit on either side of him. The back (*tua*) of the middle section is occupied by those who have to do with the preparation of kava. The village taupou maiden sits in the middle line with the kava bowl in front of her. On

either side of her sits an assistant—usually, but not necessarily, females. About midway between his own high chief and the visiting talking chief sits the principal talking chief of the village. Sometimes he occupies the opposite postion near the back. By belittling himself he exalts himself. Near him sit his colleagues.

In Manua, a curious distinction exists. Custom holds that a meeting is not properly constituted unless four talking chiefs direct matters. Hence, in their houses, the middle section has four wall posts in order that each talking chief may have a post. The custom of each chief having a post may have originated out of their utilitarian use as back rests. They are so used. The feature of importance has come to be the position as denoting function and status. A person without a post has no status in the house, and he could not enter except to serve with the attendants at the back of the house.

NUMBER OF COLLAR BEAMS

Mention has been made of the importance attached to the number of collar beams (*tauso'anga*). While the number indicates the size of the house and the status of the owner, it varies in different villages without apparently impairing the status of those in the villages with a lesser number. Hence, a high chief may have fewer collar beams in his house than a lesser chief in another village because the maximum which happens to exist in his village is less. Within the village itself, however, a distinction of at least one collar beam must exist between high chiefs and talking chiefs. In the village of Nuuuli, Tutuila, the best built house was a new one, with five tiers, owned by a talking chief. Higher than this he could not go for the number in the house of the highest chief of the village was six. There was no restriction on the high chief. If he built a new house of ten tiers, then the talking chief automatically could build up to nine. A difference of at least one had to be observed to maintain the superior status of the high chief.

COOKING UTENSILS, FOOD, AND KAVA

THE KITCHEN

The cooking house, unobtrusively situated among the vegetation at the back of the dwelling houses, was strictly utilitarian in purpose. It was used only during the time devoted to cooking, usually once a day, sometimes twice. The food was prepared, consigned to the heated stone oven, covered, and left until cooked. The cooks employed their waiting time elsewhere. When cooked, the food was placed in baskets and conveyed to the other houses. Eating did not take place in the cooking house.

The Samoan kitchen therefore contained the barest essentials; the oven site within, with its quota of loose stones and leaf covers, and the firewood without, were the essentials of equipment. A coconut grater, a few wooden bowls, and implements such as tongs, scrapers, and peelers lay on the floor. The floor was bare of mats and the walls were unscreened. Occasionally a *fata* shelf of poles was made to receive the baskets of uncooked food No reserve stock for more than two days at most was carried as the necessity for storing material ahead did not exist. Cooked food left over for another meal was usually hung up in baskets in the dwelling house where also hung the rat protectors already described.

In serving food, coconut leaf baskets, platters, leaves, and sometimes half coconut shells were all that was required. The food platters rested on the shelves in the guest or dwelling house. Baskets were quickly made from day to day. Leaves were selected from those used in the oven. Half coconut shells were picked up from the discards of grating. Water vessels were kept in the dwelling houses. Water was not used in cooking with the earth oven and little in the preparation of food. Fish were cooked with scales and entrails intact. Fowls were plucked, drawn, and singed. Every part of the pig, including blood and entrails, was used except the hair which was singed off. Before foreign governments laid on water supplies, water carried in coconut shells entailed too much labor to be wasted in washing food. The water carried to the houses was for drinking, to wash the hands of chiefs after meals, and those of the kava brewer as well as providing the medium for the kava decoction itself.

FIRE

All Polynesians have some variant of a common myth concerning the origin of fire. Most of them state that it was obtained from a region under the surface of the earth, and after being conveyed to the upper world was stored in trees. The Maori version is that Maui-tikitiki-o-Taranga obtained it from the guardian of fire, Mahuika. The Samoan version gives the names

in their dialect as Tiitii-o-Talanga and Mafui'e. Tiitii obtained entrance to the lower regions by using the magic words recited by his father, "Papa mavae, 'o a'u o Ti'iti'i o Talanga" (Rocks open, it is I, Ti'iti'i of Talanga). The rocks opened revealing a path leading downward to the region where Mafuie tended a fire. By superior physical prowess, proved by breaking one of Mafuie's arms, Tiitii obtained a burning piece of wood (*motumotu*). He returned to the upper world and with the lighted brand, struck the *tofaso*, *fau*, and other trees, thus implanting in them the spark of fire. "Before this," say the Samoans, "man ate food raw (*'ai mata*), but afterwards, by kindling the fire implanted in wood, he was enabled to eat cooked food (*'ai vela*)."

The technical elements for kindling the stored fire adopted by the Polynesians have been termed "the fire plough." They consist of a piece of dry wood laid on the ground and sometimes steadied by the foot of an assistant. Upon this a longitudinal groove is formed by rubbing with a pointed stick. The operator clasps the fingers of both hands over the front of the rubbing stick with the thumbs behind it. The stick is inclined forward at an acute angle with the lower piece. The weight is put on the rubbing stick as it goes forward while the return movement is for position. Small particles of wood are displaced by the rubbing, and as the groove deepens they accumulate at the forward end of the groove. (See Plate IV *A*, 1, 2.) When sufficient particles have accumulated forward, the rubbing movement increases in speed, heat is generated by friction, and the particles begin to smoke. At that moment gentle blowing is carefully applied and the particles smoulder and glow. The dry fabric-like material from the base of coconut leaves (*lau'a'a*) has been rubbed previously into fine pieces and rests beside the fire sticks. The grooved stick is quickly turned over, and the burning particles emptied upon the prepared material. Gentle blowing fans it into a flame, dry twigs are added, and the concealed fire captured from Mafuie burns as it did of old. Pieces of old bark cloth, plaited into a three-ply braid are also used to ignite the fire from the fire plough.

The lower grooved stick is termed *mata si'a*, the pointed active stick, *ngatu*, and the friction process, *si'a afi*. The most quickly lighted wood is *tofaso*, but most woods will respond if they are thoroughly dry. Carrying poles of *fau*, which have been in use for some time, are often used as the under piece. Even in these days, a worker in his bush cultivation, finding that he has forgotten his matches, generates fire by the ancient method often on his carrying pole when it is the driest wood available. The dry sheath of the coconut flower (*'aulosoloso*) may be used for the under piece.

FIREWOOD

The general name for wood is *la'au*, but when used as firewood, it is *fafie*. The best is *tofaso*. Next comes *toi*, which burns well while green, and *'o'a*.

Small wood was broken up with the hands assisted on occasion by the weight of the foot, while for thicker pieces, the stone adz was used.

In a contest of wit between Le Pola of Manua and one of the Malietoa of Upolu, the breaking up of firewood formed one of the points in Le Pola's victory. One morning, Malietoa's talking chief decided to supervise the cooking. There was plenty of firewood beside the cooking house, but too large to be broken with the hands. On being appealed to for an ax, Le Pola, pointing to a large outcrop of sharp rock, said that was his ax. On Malietoa expressing disbelief, Le Pola picked up a piece of firewood with both hands and beating it on the sharp points of the larval outcrop speedily reduced it to smaller pieces suitable for the fire.

The manner in which fire could be utilized in the cooking of food has exercised the mind of man in many ways with different results. The most obvious method is to expose the uncooked food to the direct heat of the burning wood, whether of flame or glowing embers, by direct contact or a space removed. This form as used by the Samoans is termed *tunu*. Any meat, and most vegetable foods, were so cooked if expediency demanded. The breadfruit was purposely grilled for a particular dish. Fowls were frequently so treated for preference.

For quantity and variety, better control of heat and a more economical use of firewood had to be devised. A medium that would retain heat and prevent the direct contact of the food with ashes, charcoal, and smoke was found in stone. Heated stones in the form of the earth oven became the accepted Polynesian method of cooking. For cooking liquid material that could not be sealed in leaf wrappers, the heated stones were dropped into a wooden bowl containing the food. This was done with the liquid of the coconut to make *vaisalo,* and with arrowroot for *piasua*. Breadfruit for *taufolo* was cooked uncovered on the heated stones, but otherwise the stones and the food were covered to retain the heat. Pottery was not made, and thus offered no alternative. Vessels of wood could not stand the direct application of heat for any length of time. The earth oven fulfilled all requirements. Necessity was satisfied, hence dissatisfaction could not stimulate further invention. Diffusion introduced nothing better until the coming of Europeans. Even with the introduction of metal vessels for heating water, the earth oven remains the principal form of cooking in Samoa.

THE EARTH OVEN

The site (*ongaumu*) of the oven (*umu*) was at one end of the cooking house. The fire was built up on the level floor or in a slight hollow. Through scraping out the ashes of successive fires, the hollow became exaggerated by the elevation of the margins. The picking up of the stones and the preparation of the oven site for another fire is termed *uluulu*.

The New Zealand Maori used a shallow pit with a stone lining to the sides to keep the firewood together. The Samoan accomplished this by using boundary logs (*langolango*) which consisted of four solid logs, trunks of banana plants, or even the butt ends of coconut leaf midribs. A square or rectangular space was enclosed by laying two opposite pieces on the ground, and crossing two end pieces above them.

In building up the fire (*pusa*) the wood was arranged so as to offer a sufficient surface for the stones and a sufficient quantity to ensure their being thoroughly heated. The lighting was *tutu*. If another fire was burning close at hand, a light was obtained from it to save using the fire plough. A piece of dry coconut husk (*pulu*) which smoulders for a long time was used. This material is often used now to light the cigarettes of an assembly and thus save matches. Arranging the stones on the lighted wood is termed *fetui*. By the time the wood burns down the stones are heated (*afu*).

The cooking stones (*ma'a umu*) are black basaltic stones the size of the closed fist or larger. They are collected from streams or beaches, and from their waterworn condition receive the name *ma'a ala*. Porous stones of lava (*anoano*) are not suitable for constant use, as they crumble to pieces through the heat.

The process of removing the *langolango* side pieces and the pieces of unburned firewood is termed *au*. After this process the stones are levelled out (*sasae*). A stout wooden pole about 6 feet long, with or without a fork, was used for leveling out the stones. This spreader is termed *sasae*, or *tofa umu*. The further process of arranging the heated stones is termed *pae le umu*. The scattered stones round the margin were put back and smaller stones placed in the spaces between larger stones to form an even continuous surface and thus distribute the heat evenly.

The arrangement of the food and leaves below and above the stones is termed *taufi*. Leaves were placed on the stones to protect the food from burning. After the food was placed in position with smaller packages to the outer side, it was completely covered with leaves to complete the *taufi* process.

TONGS

Every Samoan cooking house contained a pair of tongs (*iofi*) made by doubling a piece of coconut leaf midrib. With it, the heated stones could be picked up to place in the exact spaces required. A number were also left out at the margin of the heated bed of stones to be placed beside larger articles of food that take longer to cook. A number of hot stones were placed inside the pig. At Fitiuta, a piece of wood was laid across the oven to divide it into two compartments; one side for the pig and the other for the vegetables. The tongs were also necessary to place the heated stones in certain liquid dishes made in wooden bowls. (See Plate IV *B*.)

LEAF COVERS

The general term for the covering leaves is *tau*. They are put on in three layers. 1. The layer immediately above the food (*tau*) is composed of green leaves not previously used. The leaves in common use are those of the banana, breadfruit, the species of *talo* known as *ta'amu* and the *laufao*. Women may often be met returning from the bush with bundles of short lengths of banana leaves or other leaves for oven covers. 2. The next layer (*tau vela*) is composed of leaves which have been used before and are thus cooked (*vela*).

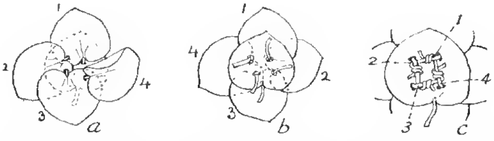


FIGURE 66.—Leaf oven cover (*tau veve*): two leaves are used together as a single element to thicken the cover. In the figure they are shown as single leaves for clearness. *a*, One set of two or even three leaves is used as the central foundation indicated by the dotted outline. With a pointed stick a hole is made through the leaves towards the outer edge, and the stalks of two leaves (1) are passed through. A second hole is pierced in such a position that it passes through the edges of the first added pair as well as through the foundation leaves below, and the stalks of a second pair (2) passed through. A third (3) and fourth pair (4) are added in a similar manner to the second so that the four pairs are evenly distributed around the foundation leaves. *b*, Under surface. The leaves are turned over to expose the under foundation leaves with stalks of the four pairs projecting through. *c*, Under surface. A pair of stalks (1) is brought to the inner side of a neighboring pair (2) and twisted around it twice from within out. The stalks around which the twists have been made are bent down to the inner side of the next pair (3) and twisted around it in a similar manner. The third pair follows a similar technique with regard to the fourth pair (4). As the first pair has already been bent down, the fourth pair must be passed under it and twisted twice around it leaving the stalk ends to the outer side. After each twisting of the stalks, the stalk ends are left to the outer side so that the bending down of the next pair fixes them effectively to the foundation leaves, while the twisting of the last pair locks them in position. The process is continued by turning the leaves over to expose the upper surface when the stalks of another set are pushed through holes made through the first set of four pairs. The circumference being greater, more leaves are used in the second set. When the circuit is completed, the leaves are turned over and the stalks fixed on the under surface in the same manner as in the first set. Three or four sets of leaves form a sufficiently large cover. This particular form of *tau veve* cover is also called a *tui veve* (*tui*, to sew together).

It is well to note here that *vela* means cooked, not warm, as in most parts of Polynesia. Warm or hot is *vevela*. When fresh leaves have been used once, they are not discarded, but are kept as *tau vela* for the second layer. They are also used as lining and covers for the baskets to contain cooked food. 3. The outer cover (*tau veve*) consists of leaves which are sewn together to form larger covers. The method of attaching them together is the same as in the Cook Islands. (See fig. 66.)

Another form of cover is made by packing the fallen leaves of the bread-fruit into the round type of coconut leaflet basket (*'ato fili tolu*). The basket of leaves is flattened down and makes an effective cover.

Earth is never used to cover over the usual cooking oven. In fact, the leaf covers of the *tau veve* and basket type are not often used. An extra thickness of the second layer is sufficient for most purposes. Sacks are now employed. No attempt is made to hermetically seal the oven, as the Samoans prefer some of the heat to escape through the interstices between the leaves. Otherwise the food is held to become stodgy and not to the taste of the Samoan palate. For a similar reason, the oven is not left covered for more than about an hour.

The Samoan method of cooking is by dry heat. No water is sprinkled over the stones or the food. What moisture there is, the food contains. The New Zealand method employs water which is sprinkled over the hot stones before the food is put on, and over the food after it is placed on the stones. Quantities of steam arise, but the cover mats are quickly put on, and the whole covered with earth to keep the steam in. The food is thus steam cooked. The Cook Islands method resembles the Samoan in not using water.

The act of opening up the oven is *fu'e*. Pigs, which are always cooked whole, are carried into the guest house whole. The vegetables and smaller packages are gathered up in coconut leaflet baskets of the *'ato fili tasi* type. The food is always carried to the other houses in these baskets which are therefore also termed *'ato fu'e umu*. The leaves from the first covering layer of the oven are used to line the bottom of the basket and as a cover for the food. They are then termed *afei*.

Earth was used to cover up the whole oven in the *umu ti* in which the underground stems of the ti (*Cordyline terminalis*) were cooked. It was also used in the very large ovens made during war. Gravel was used by Leutongi-tupaitea to cook the chestnuts (*ifi*) dropped by the bats on the rocky islet where she was marooned. This incident gave origin to the chief's title of Tau-i-iliili (the oven cover of gravel).

PROCESSES IN FOOD PREPARATION

To understand the methods of preparation and kinds of food used, it is necessary to enumerate the actual processes employed and to give the exact meanings of the Samoan words used.

To cut: *po* and *tipi* are the common words for cutting ordinary material. To cut up a pig into the parts established by custom for rank and status is *penga; polo*, to cut up a bonito into its ceremonial divisions. The term *penga* may also be applied to a bonito.

To tear: *fasi* is to divide a fowl with the hands. It was never cut.

To peel: *fofo'e* is peeling, as with green cooking bananas or cooked breadfruit, for the *taufolo*.

To slice: *fisi* means to slice off the outer skin as in removing the outer part of the *ta'amu* species of *talo*. The *ta'amu* was never scraped.

To scrape: *vavalu* is to scrape off the outer part of *talo*, breadfruit, and yam with a *'asi* scraper.

To grate: *valu* is to grate as the meat of the mature coconut with a *tuai* grater set on an *ausa'alo* wooden support. Note the difference between *valu* and *vavalu*. The term *olo* (to grate by rubbing on a rough surface of coral, as with *talo* for *fa'ausi*) is also used for grinding stone adzes.

To pound or mash: *tu'i* is pounding as of cooked breadfruit for *taufolo*, and is also applied to the modern method of pounding *kava*. *Tu'itu'i* is pounding more gently or kneading as with the fists in preparing ripe bananas for *poi*.

To squeeze: *o'omi* is with the hands as in making *poi; palu* with each hand separately as in *poi; lomi* or *lomilomi*, to squeeze lightly with the fingers as in *poi; nguti*, to crumble by light squeezing as in preparing *masi*.

To pinch off: *fifi* is done quickly as in pinching off pieces of hot mashed breadfruit in preparing *taufolo*.

To rub' *vavau* means rubbing as of the immature coconut meat in the *alava* strips of coconut leaf midrib in preparing *vaisalo*.

To wring: *tatau* is to squeeze, as wringing the liquid out of grated coconut with a *tauanga* strainer of fiber; also used in preparing kava, vegetable dye, and coconut oil.

To strain: *fa'amama* means strain; though wringing and straining are the same process, the words are distinct.

To split: *tofi* is used as in splitting uncooked breadfruit with a wooden *to'ipua* implement.

To stir: *tolo* is stirring with a wooden stirrer as in preparing *vaisalo* or *piasua*.

To wrap up in leaves: *ofu* means to wrap up small parcels in leaves for cooking as *talo* leaves in *palusami; fa'apapa* to wrap flat parcels as in *fai'ai talo; fa'ataisi*, to wrap larger bundles as in *talo fa'ataisi; afifi*, to wrap up fish—the bundle is an *afi; fa'alaui'a* is to wrap up fish in a coconut leaf and plait the leaflets round it.

To cook in oven: *tao* is cooking on hot stones covered with leaves.

To cook uncovered: *tunu* is cooking on embers or hot stones not covered with leaves.

To husk coconuts: *soso'a* is to husk with a pointed stick.

VESSELS AND BOWLS

Containers naturally divide into three classes: small, natural vessels of half coconut shells, water vessels, and wooden bowls.

Coconut shell cup (*ipu niu*). The small vessels used in connection with food are plentifully supplied by the half coconut shells that have had their contents removed in preparing coconut cream. The mature nuts are divided into two transversely, and the half shells bearing the *muli* points are picked up from the heap of discards when needed. The other half shells are unsuitable as they perforate through one of the eyes. The cups are used in serving banana *poi* and raw fish such as bonito which are cut up in a bowl with fresh water. The blood-stained water flavored with some ingredient is served in the cup with the pieces of fish. Other foods of a fluid nature such as *vaisalo* are also served in coconut cups. The shells are not specially prepared in any way beyond tearing away any of the husk fibers that may adhere round the rim. After use, they are discarded, and fresh cups provided when the need occurs.

Drinking cups for water are provided by using the specially prepared half shell in which kava is served. This together with the kava bowl forms part

of the domestic equipment. Only one such cup is necessary, for water is only served when asked for, and people wait their turn.

Water vessels. The common vessel for containing drinking water was the whole shell of the large coconuts. Large, mature nuts were husked and perforated through the *mata* eye. The liquid was poured out and the nut filled with sea water. The sea water rotted the coconut meat to a liquid consistency in a fortnight or so. The fluid meat can then be shaken out and the vessel washed out with fillings of fresh water.

A single water bottle so formed was simply called *vai* (water) or *soni,* or *fua'ivai.* An ancient Manuan name is *ta'ai.* Usually, however, the shells were tied together in pairs (*taulua*) by boring another hole through one of the depressions near the *mata* hole already made. A piece of sennit braid was run through the two holes and tied while the other end of the sennit was passed through the pair of holes in another shell, and the two thus looped together. Two pairs were again looped together so as to enable them to be hung over the end of a carrying pole. Plate IV *D* shows two sets of four hung over the short carrying pole that was usually used. In many of the more remote villages, the women can still be seen carrying home the supply of drinking water in these vessels. In most of the Polynesian islands the suspending cords of the water vessels are neatly braided, but the Samoan examples figured are very roughly tied together without any particular attention to neat technique.

Pratt (23, p. 300) gives *tangatanga* as a net to hold water bottles, but no samples were seen by me. A *tulula* is also a long basket to hold vessels. Gourds called *fangu* were also used to contain oil. They were said to be small and their use as water vessels was denied.

Large bamboo stems (*'ofe*) were at one time used as water vessels, the end nodes shutting off a hollow compartment while the intermediate nodes were perforated. The upper end node was of necessity perforated, and then closed with a stopper. For a recently made concrete construction in a back village in Savaii, the water was carried from a neighboring spring in bamboo receptacles.

Wooden bowls (*'umete*) were used in the preparation of foods such as coconut cream (*pe'epe'e*), *poi, fa'ausi,* and *taufolo.* For the more liquid foods cooked by dropping hot stones into the food, wooden bowls were an absolute necessity. For cutting up uncooked fish to serve raw the wooden bowl was also needed. Thus, though wooden bowls were a necessity in culinary operations, the range of use was somewhat restricted as many of the uses usually associated with bowls were not in vogue. Food was not washed. Except for the foods mentioned above, cooked food was transported direct from the oven to the eating house in baskets. From them the food was placed on leaves and plaited platters, and wooden bowls were not necessary for serving pork,

fish, fowl, or vegetables. The easily procured coconut cup took the place of bowls in serving the more liquid foods. Even for washing the hands, it was usual to pour the water on them. The special bowls used in preparing kava are described under that heading. Outside of food, bowls were used in the preparation of dyes, and for holding the instruments during the operation of tattooing.

Bowls were made usually of *ifilele* and *milo* wood. The *Callophyllum inophyllum* wood so much used in eastern Polynesia though present in Samoa was not in favor as material. The bowls were cut out of the solid. Food bowls are called *'umete* to distinguish them from the kava bowls which are called *tanoa*, though food bowls are now sometimes loosely referred to as *tanoa*. Special names for variations in shape were not used, but they were roughly classified into large bowls (*'umete tele*) and small bowls (*'umete laitiiti*). From the shape of the opening they may be classified as elliptical, round, and acute elliptical.

In the manufacture of bowls, the external surface (*lau*) is shaped first of all. The bottom is left flat and for elliptical and round bowls, projections are left at either end to form handles. The sides are shaped with an even convex curve from rim to bottom while towards the ends, the converging surfaces are made to meet in a mesial longitudinal edge which extends upwards from the bottom to the under surface of the handle projections. The upper part of the wood is cut off level or in a slight curve longitudinally to define the rim and the upper surface of the handles. The handles (*'au*) project outwards with a flat upper surface the sides of which are parallel or slightly constricted at the junction with the rim. The two sides of the handles are shaped downwards and inwards to an edge which meets the mesial longitudinal edge formed already. The outer ends of the handles are cut off square or they may form a slight slant inwards or outwards.

The bowl cavity (*liu*) is then hollowed out by commencing with sharp downward strokes to define the inner edge of the rim. A carpenter seen at work judged entirely by eye and had no hesitation in placing his strokes. At the sides, the inner curve runs parallel with the curve of the outer edge but towards the ends it gradually leaves it to form even rounded ends in elliptical and round bowls. In acute elliptical bowls, the inner curve runs parallel with the outer curve throughout and the curves from either side meet at an angle at the ends. The shaping of the cavity defines the upper surface of the rim (*laufa'i*) which is horizontal and gradually widens towards the ends where it is continuous with the upper surface of the handles. As the work deepens, the curve of the interior becomes sharper to make the bowl thicker towards the bottom than at the rim. In larger bowls, the bottom is flat but in smaller bowls, the bottom is rounded. In elliptical and round bowls, the natural, flat external surface is maintained and does away with the use of legs but in

acute elliptical bowls, the bottom is shaped into a pair of short projections on either side by cutting away the intervening material and continuing the general external curves to meet in an edge on the bottom between the lateral pairs of projections which makes the mesial longitudinal edge on the bottom continuous with that of the ends. (See fig. 67.)

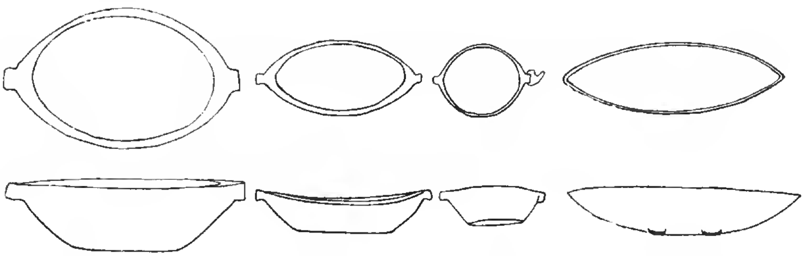


FIGURE 67.—Types of bowls: upper row, view looking into bowl; lower, side view. *a*, Medium sized elliptical bowl; common shape with handle at each end. Outside measurement, length 21 inches, width 12.75 inches, depth 5.75 inches; rim with projecting sharp external edge, width of upper rim surface in middle transverse line 0.6 inches, thickness of bowl 0.2 inches; below upper edge where rim projection meets it 0.3 inches; handles, length in middle line 1 inch, width 2 inches, depth 1 inch, triangular in section with lower sharp edge. Median longitudinal edge present extending from lower edge of handle to flat bottom. Bottom, thickness 1 inch, flat internally. Length breadth index, 67. *b*, Smaller long elliptical bowl, flat bottom with handles. Outside measurement, length 15.5 inches, width 7.25 inches, depth 3 inches. Upper rim surface formed by meeting of planes of outer and inner surfaces of bowl, no projecting outer edge: width in middle transverse line 0.3 inches gradually increasing towards ends. Handles, length, 0.6 inches; width at outer ends, 0.9 and 1.1 inches; depth, 1 inch; constricted at junction with bowl; bottom flat externally, rounded internally. Length breadth index, 56. External longitudinal edge at ends present. *c*, Small round bowl. Length between handles 9.2 inches, inside length of rim opening 7 inches, inside width 6.7 inches, outside depth 3 inches; handles, length, 0.7 inches; width, 0.8 inches; depth, 0.9 inches; right handle perforated for sennit loop for suspension when not in use; bottom flat externally, rounded internally; external longitudinal end edges present. Length breadth index of opening, 95. *d*, Acute elliptical bowl with legs, no handles: length 21 inches, width 6 inches, depth not quite 4 inches; external and internal surfaces meet at sharp angles at ends, the acute angled groove on inner surface continued down from ends towards the bottom. The external longitudinal edge continuous from ends along under surface of the bottom, but bottom is rounded internally; legs consist of a pair of short projections on either side of middle line, each leg roughly rectangular 1.6 inches longitudinally, 0.7 inches transversely, depth 0.3 inches on the inner side which allows mesial longitudinal edge on bottom to rest on the ground. Opposite pairs 1.4 inches apart, legs on same side 3.3 inches apart.

After the bowls are completed, they were left to soak for some considerable time in water holes to season the wood and prevent splitting. At Asau, Savaii, large numbers of bowls were seen lying on the bottom of the pools in which bathing took place.

Of the three forms of bowl, the elliptical was by far the commonest. The round bowl (see figure 67*c*) is not quite circular, for the longitudinal diam-

eter is slightly greater than the transverse, and this is emphasized by retaining the external longitudinal mesial edge at the ends. Kramer (18, vol. 2, p. 133) figures a round bowl with legs, a serrated rim, and one long handle with a downward projection from its outer end.

The acute elliptical bowl, owing to the sharper grooved ends acting as spouts, could be used for pouring out liquids.

The *masoa* bowl. The bowl for preparing *masoa* (arrowroot) (Pl. X *D*) could be classed under round bowls but the construction and use is so specialized that it is classed separately. The bowl which was obtained in Leone, Tutuila, was made in Savaii in 1866 and is very large as Samoan bowls go. The features are the circular shape devoid of any external longitudinal edges, and the round bottom necessitating the use of legs and the four handles. The handles appear like sections of a pole stuck horizontally against the side of the bowl. The rounded nature of the handle in cross section enables the fingers to secure a firm grip.

Attention has been drawn to the distinction between *'umete* and *tanoa* which is breaking down. An old name for a food bowl in Manua is *taneuli*. The *masoa* bowl was called a *tanoa* by its donors, the Ripley family. If correct it is due to the rounded form with legs resembling the kava bowl in construction. If there was a distinction in name between the elliptical, round, and acute elliptical forms, they have been forgotten. Following the general Polynesian custom, qualifying terms denoting the use to which the bowl was put are often added in conversation. Thus the small round bowl (fig. 67 *c*) was *'umete fai palusami* (bowl for preparing *palusami*); the elliptical bowl (fig. 67 *b*), *'umete fai taufolo* (bowl for preparing *taufolo*); and the acute elliptical form (fig. 67 *d*), *'umete fulu fa'i* (bowl for preparing bananas). As *palusami, taufolo,* and bananas have been seen constantly prepared in the ordinary larger elliptical bowls, these terms may be regarded as general descriptive terms, and not specific names. They happened to be the particular bowls so used at the particular time by the family who disposed of them, and the terms described the use to which they had been put. Other families might apply similar terms to differently shaped and sized bowls. As an exact Samoan terminology they can not stand.

FOOD UTENSILS

Utensils here include instruments, implements, and vessels for domestic use, grouped together for ease of reference.

An oven spreader (*sasae* or *tofa umu*), a stout, five-foot-long pole used in spreading the hot stones of the oven has been described. It may be straight or forked. There is nothing special in its technique. Any pole does; it is an implement of convenience which is in general use.

Oven tongs (*iofi*) are made of a piece of coconut leaf midrib, 2 feet or more in length. The side edges bearing the leaflets are trimmed off. It is doubled at the middle so that the outer wood fibers snap while the inner ones remain to form a hinge. The ends are trimmed off level if they do not coincide. A green midrib is used which dries without impairing the utility of the implement. Tongs are constantly used in shifting hot stones in food preparation, and are an indispensible article in every kitchen. (See Plate IV *B*.)

Knives. The long-bladed steel knife is now universally used as ax, slasher, and for general use, from cutting down small trees to carving pork. The original *sele* knife consisted of a strip of bamboo split off to leave a sharp edge. Though no longer used in the kitchen it was exclusively employed in olden times for slicing off the outer part of the *ta'amu talo,* cutting up raw fish, pork, and the few culinary operations in which a knife was needed. It is still occasionally used by women in cutting off strips of bark cloth and weft ends while plaiting.

Peelers (*fofo'e*) are pieces of wood or bamboo, about 4.5 to 6 inches long and 0.5 to 1 inch wide, brought to a flat rounded cutting edge point and used for peeling green bananas and the grilled breadfruit for *taufolo*. The banana skin is incised longitudinally along the concave side with the point which is then used to separate the skin on either side and pry it away from the fruit. The *fofo'e* is used to remove the baked outer rind of the *taufolo* breadfruit because it is too hot to manipulate with the fingers.

Scrapers (*'asi*) are made from discarded half coconut shells. Part of the outer edge circumference is cut away to form a sharp edge. (See Pl. IV *E*.) The fingers are spread around the outside circumference of the shell with the thumb above the cutting edge and the strokes are made downwards away from the body. (See Pl. VII *C*.) Yams, *talo*, and breadfruit are always scraped (*vavalu*) before cooking. The breadfruit is scraped in longitudinal strips a little apart on the first round and the intermediate parts scraped on the second or finishing round.

A fair-sized hole is made through the bottom of some scrapers. The hole allows the scrapings which would otherwise adhere to the inside of the shell to pass through. The scraper is also more readily cleaned.

Mollusk shells such as that of the *sele* are sometimes used. When used for scraping breadfruit, it is called a *sele fatu*. The term *'asi* also belongs to a mollusk shell used in scraping bark for cloth, but as applied to the kitchen, it definitely means the coconut shell scraper. The mollusk shell *Tonna* shown in Plate IV *C* was obtained in Manua, and was used as a *talo* scraper. To form the grating edge an oval hole was made through the shell.

A round stick, about 2 inches in diameter, is driven into the ground just

outside the cooking house to form a rest (*valusanga*, or *tu'itu'i*) for the vegetables as they are scraped. The upper end which is about 6 inches above the ground is cut off level or wrapped with coconut husk (*pulu*) which is tied with a strip of *fau* bark. (See Pl. VII *C*.) Besides supporting the food, the rest allows the gratings to fall clear. In Tutuila the bare stick (*tu'itu'i*) was seen in use. In Upolu and Savaii, the covered end was in use and was termed *valusanga*. The advantage of the husk covering was that it prevented slippery objects such as yams from slipping off the end of the rest as they were turned. It also saved the edge of the grater from being blunted or chipped when it occasionally struck the rest in the downward sweep. Yams and *talo* are not washed beforehand. Scraping removes both dirt and skin so that further cleaning with water was regarded as unnecessary.

Graters. Three forms of graters are used for coconut, *talo*, and turmeric. Of these the coconut grater is in everyday use and forms an essential part of the kitchen equipment.

1. Coconut grater, consists of two parts; the *tuai* grater, and the wooden frame upon which it is mounted.

The *tuai* was formerly made of coconut shell (*ipu niu*) cut into a rectangular piece about 3 inches long and 2 inches wide. The end which forms the cutting edge is cut away on the convex outer surface of the shell to form a bevel which meets the inner concave surface to form the sharp cutting edge. The cutting edge is straight transversely with a slight rounding off at each end. In the model (Pl. V *A*), the *tuai* has curved sides and the cutting edge is concave transversely with the ends sloping around to the sides. The concave cutting edge, however, appears to be the result of bad workmanship and the straight or slightly convex edge is the normal form.

The *ausa'alo* is selected from the trunk of a small tree or a large branch with two other branches projecting out close together. The end of the trunk or main branch with the two smaller branches forms a tripod as shown in the models (Pl. V *A*). The trunk or main branch resting on the ground at one end and raised towards the other by the two natural legs forms a slanting beam. To the raised end which projects from 6 inches to a foot beyond the leg attachments, is attached the *tuai* grater. The end is trimmed down in large, natural frames and a slot about 2.5 inches long cut on its upper surface. The depth of the slot is sufficient to provide a surface 2 inches wide to support the *tuai*.

The *tuai* is placed with its convex surface downwards on the slot and with the cutting edge outwards. It is lashed in position with sennit braid. In the models one lashing is accomplished by transverse turns set closely together, while in the other it consists of diagonal turns crossing in the middle line. Owing to the nature of the material the upper surface of the *tuai* is concave both transversely and longitudinally. This causes the cutting edge to be directed upwards away from the surface of the woodwork. In one of the models (Pl. V *A*, 1) another shorter piece of coconut shell with its outer end bevelled, is placed between the wood and the *tuai* as a chock to prevent the force of grating from snapping it off. The full-sized frame is characterized by its large size and clumsy appearance. The main slanting beam is usually 6 inches or more in diameter. The two natural legs raise the cutting part well above the ground, thus allowing a large wooden bowl to be placed on the ground below it. The cook sits astride the slanting beam, and, holding the half coconut firmly with both hands, works the inner meat part of the nut against the cutting edge with downward scraping movements. The gratings (*penu*) fall down into the bowl. More modern supports consist of a single beam of

sawn plank, which is rested over a log when in use. Others have a couple of board legs nailed on near the grating end, and may even have a peg at the back end as in the form figured by Handy (14, p. 19).

Besides being made of coconut shell, *tuai* were sometimes made of stone. A stone *tuai* found at Leone had a chipped convex cutting edge with a partly ground bevel on the under surface as in the coconut shell form. The stone *tuai* hafted for Mr. Judd was regarded with distrust until further field work revealed its proper function as a grater and not an adz. (See Pl. V, *E*.) The *tuai* made of iron have now completely displaced the old forms. They are usually slightly convex at the cutting edge, which is serrated. The four-legged curved seat with a projecting arm to carry the grater, characteristic of the Cook, Society, and eastern islands, is unknown in Samoa.

2. Coral grater (*lapa*). The uncooked *talo* was grated for the important *fa'ausi* preparation. The coconut grater was unsuitable, so recourse was had to the oval-shaped pieces of coral of the genus *Fungia*. These have sharp ridged edges set close together which served excellently as a grater on which the *talo* was rubbed. They are called *lapa*. In parts where *Fungia* was not obtainable slabs of lava with rough surfaces formed by the bubble holes are said to have been used. Sheets of tin have now displaced the coral. Holes set close together are made with a nail from one side, and the raised margins of the holes on the opposite side form a more durable grater.

3. Sennit grater. Turmeric root (*ango*) was grated to prepare the turmeric yellow powder. The grated material, after mixing with water and straining, divided into an upper layer of *lenga* and a lower, heavier layer of *malasina*. The *malasina* was cooked as food.

The grater was made by wrapping sennit braid closely around a pole about 1.5 inches in diameter for a distance of about 18 inches. The commencing end of the braid was fixed by slanting it down in the direction of the wrapping and burying it under the turns. At the end of the wrapping three or four loose turns were made, the sennit end passed back under them, and the turns successively drawn taut. After drawing the last turn taut, the braid end was pulled to remove the slack and the sennit cut where it issued from under the turns.

Arrowroot (*masoa*) was also grated with the sennit grater before the adoption of the perforated tin article. Grating on coral or sennit is termed *olo*.

Pounders. The pounding of cooked foods in Hawaii, Society, Cook, and the Polynesian islands to the east, is a characteristic feature of their methods of preparing foods. It has resulted in the evolution of various forms of stone pounders. Beautifully made implements with various shapes and grips have become characteristic of different groups of islands. Stone pounders have been curiously lacking from Samoa. It was thought that the Samoans, being Polynesians, must have possessed such implements, but that they had been strangely overlooked by collectors. The study of the various forms of food

preparation which follows reveals the curious fact that the Samoans never used stone food pounders. The pounding of cooked foods only enters into two food preparations, the *taufolo* made of breadfruit and *talo*. Outside of cooked food, the preparation of the kava root should be expected to need a stone pounder. Kava, however, was chewed until recent times. The pounding of the root which has succeeded the old method of chewing, is done with any stone of suitable size. Any leaves or bark that were used for fish poisoning or other purposes that needed pounding, were subjected to beating between two stones. Samoan material culture thus provided nothing in the form of a worked stone pounder. An occasional kava pounder may be seen with a slight notch to fit the fingers, but even this primitive attempt is modern. Each of the two mashed foods mentioned had its own type of pounder.

The Samoan breadfruit pounder (*autu'i*) is surely the most primitive of food pounders. To understand its evolution we must picture the conditions that called it into use. (See Pl. VI, *B*.)

Beside the heated stones of the oven lies a pile of breadfruit. The young men lay the unscraped breadfruit on the heated stones and grill them until they are cooked. The charred outer rind of the cooked breadfruit is removed with wooden peelers and the cooked flesh placed in wooden bowls. The breadfruit being in the more mature stage is fairly soft. It could be mashed by pressure with the closed fists, but as the *taufolo* preparation is made immediately, the heat prevented the use of the fists as pounders. Something is needed to press down the heated mass. What is more natural than an unscraped breadfruit from the nearby pile. This is done, but as the improvised pounder sinks into the mass the hot material comes in contact with the fingers. A handle is quickly formed by inserting a pointed stick into the breadfruit pounder. But one stick works loose and comes out as the pounder is lifted. The solution to the difficulty is four or five sticks which, by being held together, gripped the interior of breadfruit and made a handle that does not work loose. The improvised pounder with these improvements finishes the job. (See Pl. VI, *C*.)

As *taufolo* is only made on special occasions, an incentive is lacking to construct a permanent article for continued daily use. Each making of *taufolo* produces its own pounders.

The breadfruit pounder (*autu'i*) shown in Plate VI, *B* consists of four or five such pointed sticks stuck into a breadfruit around the circumference of the stalk attachment, a little distance apart. The sticks are held together in the grip of both hands which thus squeeze them together, gripping the flesh of the breadfruit. The implement is used for pounding cooked breadfruit. As shown by their stone adzes, the Samoans showed little inclination to do more working with stone than was absolutely necessary. As the breadfruit pounder proved effective, it is little wonder that no stone food pounders have been collected from Samoa. They were not made.

Talo pounder (*ulu lapalapa*). According to Kramer (18, vol. 2, p. 151) a *taufolo* mashed preparation was also prepared from cooked *talo*. During a six

months' sojourn among Samoan villages I saw breadfruit *taufolo* made on numerous occasions, but did not see *talo taufolo* nor was it described to me under food preparation. The cooked *talo* is firmer and more fibrous than the breadfruit used for *taufolo.* Something harder was needed as a pounder. The easiest and most available material was the butt end of the coconut leaf midrib (*ulu lapalapa*) which was used and discarded when its use was over.

Poi pounder. The poi preparation of Hawaii which is so widely known is made of well-pounded cooked *talo.* In Samoa, the term *poi* is confined to a preparation of mashed ripe bananas. In the preliminary stages ripe bananas were pounded or really mashed in a wooden bowl with the closed fists. The closed-fist pounder is mentioned to show the general attitude of the Samoans towards pounding or mashing food. The fists, the uncooked breadfruit, the butt of the coconut leaf midrib—anything to serve the purpose for the particular occasion.

Strainers and wringers. In extracting liquids from chewed or scraped solids, the process of wringing and straining went on at the same time, and the material used discharged both functions. Wringers were used in the preparation of coconut cream, *vaisalo,* and kava. Each preparation had its distinctive wringer and strainer.

There are two varieties of coconut cream wringer (*tauanga*): 1. The *tauanga* of *laufao.* The proper strainer is made of *laufao* (*Heliconia bihai*), which has leaves and a stem somewhat resembling the banana. The stem, formed of layers of the butt ends of the leaves, is cut off in a length of about 3 feet. With a *fofo'e* wooden peeler, the edge of the outer layer is peeled off in a narrow strip. Working from this edge, narrow strips of the single layer are peeled off until a sufficient quantity is obtained. (See Plate V *C.*) The strips are picked up in a handful and rubbed between the hands progressively along their length. The rubbing to crinkle the strips is termed *nguti* or *ngutinguti.* One end of the bundle is then held firmly in the left hand, while the right hand sharply jerks (*se'i*) sections of them out. When so treated, they are rubbed and mixed together to form a tangled mass, and a sufficient quantity forms a *tauanga.* (See Pl. V, *D,* 1.) The *tauanga* is used to express the coconut cream (*pe'epe'e*) from the grated mature nut (*penu*) prepared with the *tuai* grater. The wringer is spread out and a quantity of the grated nut scooped up out of the wooden bowl. The fibers are folded around and the strainer twisted in the hands until all the liquid is expressed into the bowl. The strainer is opened out and repeatedly flicked to shake off all the dry particles of coconut meat. The process is repeated until all the grated nut has been treated and only the white, creamy liquid remains in the bowl. Thus, not only is the liquid squeezed out of the gratings by wringing (*tatau*), but the fluid in the bowl has been

strained (*fa'amama*). 2. The coconut husk *tauanga*. Many Samoans told me that wringers were not made of coconut husk fiber (*pulu*). In spite of that, I saw it used in Fitiuta and other parts, and specimens are present in Bishop Museum. (See Plate V *D*, 2.) The husk of the mature nut is beaten to remove the interfibrous material and the fibers rubbed up into a tangle. It is used in the same way as the *laufao* wringer. The best material is *laufao* and coconut husk is used as an emergency substitute. Collectors of information must be careful of some of the idiomatic uses of the Polynesian language. When a Polynesian says a certain thing is not done, he sometimes means that it is not right, correct, or orthodox, and therefore, so far as the informant is concerned, it does not exist. When it is afterwards pointed out to him that you have seen the thing he denies, he shrugs his shoulders and explains that it is not the correct thing. He is an idealist when circumstances do not force him to abandon the orthodox. The *fau* bast is not used for coconut cream wringers.

The mincer (*alava*). This consists of narrow strips of the skin of the coconut leaf midrib near the expanded butt end. The edges of the strip provide a blunt cutting edge. A number are gathered together in a mass and used in the preparation of *vaisalo* from the flesh of the immature coconut which, fairly soft and scraped into the bowl to join the fluid part of the nut, is picked up in the *alava* and rubbed between the hands (*vavau*). The edges of the *alava* strips act as a primitive mincing machine and cut the flesh into smaller pieces which may be left with the fluid. In the form of *vaisalo* used for invalids, after rubbing the larger pieces, the *alava* is used as a wringer to express the liquid. The particles of flesh are then flicked off. In this process, the *alava* acts as both wringer and strainer.

The kava strainer (*to tau ava*) is made of *fau* bast, and is described on page 151.

Breadfruit splitters (*to'ipua* or *to'i'ulu*) are in common use throughout Samoa for dividing large breadfruit into halves or quarters before cooking. In appearance they resemble hafted adzes and are termed *to'i* (adz). They are mostly made of *pualulu* wood, but *fau* is used.

A branch ranging from 1.25 to 1.5 inches in diameter is selected and the part of the trunk both above and below the branch junction is removed with the branch. The trunk portion when removed is roughly about a foot long and over 2 inches thick. The upper part of the trunk portion which forms an acute angle with the branch, is shaped into the blade, which ranges from 2 to 2.5 inches in width and deepens in thickness from the distal cutting edge to about 2 inches at the branch junction. The cutting edge is rounded with the convexity downward with the implement in the position for use. The lower trunk portion in use is turned upwards to form a heel which ends in a point. In some adzes (Pl. VII *A*, 1, 2), the heel is blunt and is formed by the meeting of the plane of the blade with the line of the handle. In others (Pl. VII *A*, 3, 4), the heel projects upwards beyond the line of the handle and forms an obtuse angle with it. The branch is cut off to form a suitable handle.

The action of splitting by means of a blow is termed *tofi*. In some implements, the handles are straight, but in others a curved or bent branch is selected to form a better angle with the blade.

Food stirrers. A strip of coconut leaf midrib split to a suitable thickness is often used for stirring preparations of *piasua* (arrowroot) and *vaisalo* (coconut) to which hot stones have been added. To stir is *tolo* or *sa'eu*, and the stick so used is *tolo*, or *la'au sa'eu*. With the introduction of the bush knife, a strip of *fau* wood is readily prepared, and is now more commonly used as a stirrer.

Seed flicks. In the preparation of breadfruit *taufolo* (Plate VI *C*) an assistant, seated opposite each man using the breadfruit pounder, holds a stick (*i'o fatu*) for flicking out the hard, immature seeds (*fatu*) that appear in the breadfruit. Formerly, strips of coconut leaf midrib were used, but a thin, flat piece of *fau* wood about a foot long, trimmed with a knife, has supplanted them. There is no special distinction in shape between a food stirrer and a seed flick, but they have received their distinctive names from the use to which they are put.

MISCELLANEOUS

Some implements not so intimately associated with the cooking house but still used in connection with food are here described.

Coconut husker (*mele'i*). A stake of *olamea, poumuli,* or some hard wood, about 3 to 4 feet long and 1.5 inches in diameter, sharpened at both ends, is used for husking coconuts. If a hard wood is not at hand, *fau* is used.

The lower end with an ordinary point is driven into the ground at a slant. The upper end is cut on a single bevel to form a convex cutting edge with the round section of the stake. The side cutting edge point of the stake penetrates more readily through the longitudinal fibres of the husk. The coconut is held at the ends with both hands, and driven down on the point with its long axis corresponding with the wide axis of the point. The far side of the nut is applied to the point so that the blow forces the point through a segment of the husk with the nut towards the husker. The husk segment is torn off by levering the nut towards the body. Successive segments are removed in this way until the nut is denuded of husk. If the point of the stake does not come right through a segment on the downward blow, the nut is pressed down until the point comes through. Husking takes place in the plantation and the nuts are carried home in baskets slung on a pole. Both green and mature nuts are husked in this manner. The common name of the husker is *mele'i,* but Pratt (23, p. 50) also gives *o'a*.

Climbing bandage (*aufanga*). To facilitate the climbing of coconut trees to obtain drinking nuts a loop of *fau* bark is sometimes used. (See Pl. V, *B*.)

Both feet are placed in the loop so that the ends pass over the dorsum and under the instep. The climber grasps the palm trunk high up, draws up his feet and rests the climbing bandage against the trunk where it takes a grip against the rough surface. He straightens up the body, takes another hand grip higher up, and draws himself up for another bandage grip. For ordinary trees, the climber usually walks up on all fours, the hands clasping the trunk on the side away from the feet. In tall trees, the bandage enables the climber to rest on the bandage and relieve the strain on the arms.

Breadfruit pickers (*lou'ulu*). The breadfruit out of reach are detached from the tree with a long pole usually of *fau*, with a fork at the end. Three forms, the "X" picker, the "Y" picker, and the netted picker, are in use. (See fig. 68.) The "X" picker is the most common. (See Plate VI, *A*.)

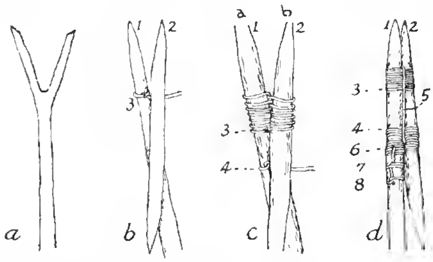


FIGURE 68.—Breadfruit picker (*lou'ulu*): *a*, "Y"-shaped picker, a long pole with a natural fork formed by two branches which are cut off to form two prongs a few inches long. The fork is twisted around the stalk of the fruit to snap it. It is an emergency form not in common use. *b*, *c*, and *d*, "X"-shaped picker with fork made by lashing a 15 inch length of rod, sharpened at both ends, to the top of a long, straight pole also sharpened; *b*, a length of braid is tied with a running noose (3) to the long pole (1) about 4.5 inches from the end, and the short rod (2) crossed at an acute angle with their upper ends level; *c*, the braid is passed behind the short rod, drawn around it to the front and passed backwards between the two wooden elemens to make a similar turn around the pole. In this way turns are made alternately around the rod and the pole, the braid passing backwards between the two and working upwards until 8 or more turns have been made. The top turn around the pole is brought down behind the lashing to 2 inches below the commencement (3) where the braid is tied around the pole with an overhand knot (4); *d*, a second set of lashing turns is repeated in the same way, but the turns work downwards. The first turn from the knot (4) passes in front of the rod so that the crossings between the pole and the rod are made forward instead of backwards as in the upper lashing. After the 8th turn around the rod, the braid is run longitudinally upwards between the pole and rod (5), over the front of the upper lashing, and then down at the back to continue a few more turns around each element to continue the lower lashing downwards to the point (6). Three loose turns are made around the pole alone and the end of the braid pushed upwards under them. Each loose turn is drawn taut commencing above and the braid also pulled taut. This is the usnal method of fixing the end of a single braid, but in the picker figured, two other turns (7) were made lower down and a single turn (8) lower again to finish off the lashing. The actual middle point where the rod and pole cross is between the lashings. The sets of lashing on either side of the crossing point maintain the two wooden elements at the right acute angle. The figures (*c*) and (*d*) show views at different angles to explain the technique.

In the "X" picker the angle included by the two arms is more acute than in the "Y" picker, making it easier to remove the fruit. If the fruit stalk is missed by the front angle it may be hooked with the arms at the back and pulled off. The netted picker consists of the ordinary "Y" picker with somewhat more divergent arms to which a bag net is attached. This is termed *fangafanga* and not *'upenga*. The stages of manufacture are shown in figure 69. In attaching to the handle, the circumference is arranged so that the sennit braid from the last knot is at the junction of the arms. Two or three circum-

ferential meshes on either side are threaded over the two arms of the fork. The sennit end with the hank is drawn taut and tied to the handle. (See fig. 70.) The netted picker is used at Fitiuta in Tau where the ground is covered with sharp pointed lava which would break the fruit if it fell to the ground.

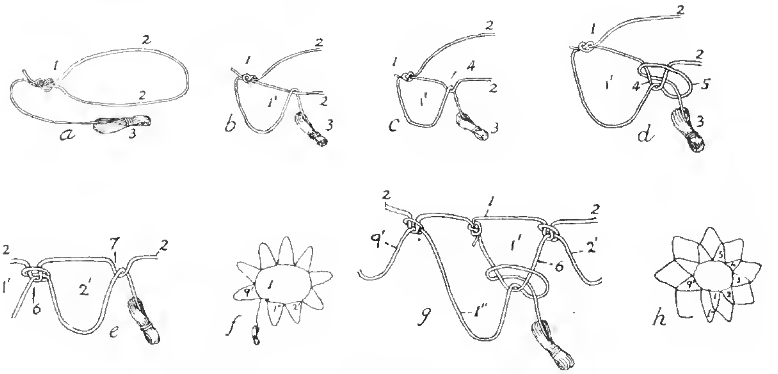


FIGURE 69.—Breadfruit picker net-technique: *a*, the free end of a small working hank of sennit is doubled back to form a circle about 3 inches in diameter and tied with an overhand knot (1) and a closed loop is hooked over the big toe to form a suspensory loop (2) around the circumference of which a row of mesh loops is to be attached; *b*, the hank (3) is passed over the suspensory loop about an inch to the right of the knot (1) to form the first mesh (1′) which is gauged to about 1.3 inches deep by the left middle finger pulling it against the hank held by the right hand; *c*, the left thumb and forefinger pinch up the suspensory loop on either side of the crossing braid to form it into a loop at (4); *d*, the hank now makes a loose loop (5) on the right, passes to the left over the two limbs of the loop (4) still held by the left finger and thumb, passes back to the right under them, and up through the loop (5) on the right, the hank is drawn taut and the left fingers let go (this is the netting knot which is used throughout); *e*, the first mesh (1′) is formed by drawing the netting knot taut at (6), the second mesh (2′) by passing the hank, on inch to the right of the last knot, over the suspensory loop which is again pinched up to form another loop (7) and the netting knot is made in exactly the same way as the first; *f*, the meshes are continued around the circumference making each knot an inch to the right, which brings the knot of the last mesh (9′) close to the commencing knot (1) and the first row of meshes is completed. The pinching up of the suspensory loop by each mesh knot leaves its circular diameter about 1.5 inches and forms the bottom of the net. *g*, The second row is commenced by passing the hank from the knot of the last mesh (9′) over and through the first mesh (1′). The bottom of the new mesh (1″) must be gauged to the level to be taken by the lower ends of the meshes of the second row. The same netting knot is tied, but here it is easier as a loop has not to be pinched up. *h*, The second row is formed by working to the right and tying the netting knot successively to each mesh of the first row. The left middle finger gauges the meshes so that the bottom coincides in depth with the first mesh (1″). The figure shows the completed second row flattened out, but in the actual netting, the suspensory loop is rotated on the big toe and each mesh is gauged in depth from the one preceding. After making the last knot on loop (9′) the next mesh closes the second row and commences a new row. To make the new mesh much deeper than the bottom of the mesh (1″) would be to make a very large mesh which would go on increasing in size after the first of each row. It is therefore shortened practically to the same level as (1″) to which it is attached. The next mesh gives the true lower level of the third row. The meshes gradually increase in size to about 3 to 3.25 inches in depth. The successive rows are continued until the net is about a foot in depth.

Breadfruit pickers are easily made so they are not saved up for the future season. Though there are about three crops in one year, a new picker is made for each. Hence the saying: "O le fuata ma lona lou" (The breadfruit crop and its picker).

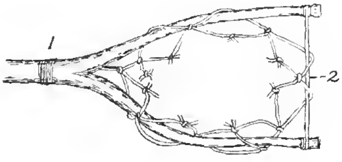


FIGURE 70.—Breadfruit picker, net attachment: 1, lashing of end braid of net to handle. A piece of braid (2) is tied to the end of one of the arms, passed through a couple of circumferential meshes, drawn taut, and tied to the other arm. The cross braid (2) is called the *fau ta'i* and is important as it falls on the far side of fruit as the net is brought down over it. It leads (*ta'i*) the fruit into the net where the stalk is caught in the fork. The picker is then twisted to bring the net underneath. As the stalk snaps the fruit is left in the net.

Carrying poles (*amo*). Burdens are carried slung to either end of a pole, which is balanced on one shoulder. The pole is nearly always of *fau*. Since bush knives are always carried to the cultivations, a pole is quickly made by cutting down a sapling and making a notch at either end. The form of notch in figure 71*a* is the usual one. If, owing to a basket being too full, both sides of the midrib rim will not stay together, the rim to the outer side is kept in the notch. (See Plate VII, *D*.)

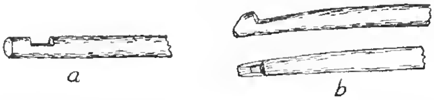


FIGURE 71.—Carrying pole (*amo*): *a*, ordinary pole of *fau*, with square notch cut near ends. *b*, *Fau* pole, 2 inches in diameter with ends trimmed to form a knob about 2 inches long, 1.25 inches wide on inner side and 1 inch wide on outer side. The inner side of the knob is about 0.8 inches deep; side view above and upper view below.

Some poles are shaped like that shown in Plate VII *B* and figure 71 *b*. This pole has two fire grooves on the under surface opposite the notch and is slightly concave longitudinally on the under surface, caused by the shaping, combined probably with the effect of the weight at the ends when the pole was green.

The coconut water bottles are carried on a much shorter pole. The poles are in common use in Samoa. Many of the men have fibrous lumps on the shoulders caused by continual use of the carrying pole. Even with one basket of food, a Samoan would sooner carry it slung over his back on a pole than in his hand.

Carrying straps (*faufafa*). Women carry large bundles of leaves for the oven, sugar cane leaves, and other material strapped to the back by strips of bark. To carry on the back is *fafa,* and the burden *fafanga.* The bark of the *fau, fu'afu'a,* or the *fue* creeper are used for tying on the burden. These bark strips are termed *faufafa.* Pratt (23, p. 120) gives *faufili* as a cord used for tying on the burden. There may be a distinction to denote plaiting from *fili,* to plait. Another term, *avei,* is also used.

The bundle is first tied together. A single strip of the tying material is passed vertically over the back of the burden on one side. The long end of the strip passes over the shoulder on that side, then diagonally downwards across the chest, under the burden, vertically upwards at the back, over the shoulder, and diagonally across the chest to meet the other end to which it is tied in front.

FOODS

VARIETIES AND USE

There is so much detail in connection with foods that it is advisable to deal with each article separately. Foods divide naturally into flesh and vegetable foods.

Flesh foods consist of pork, fowl, certain wild birds, turtle, fish, crustaceans, and shellfish. Pork forms the most desired food, and on all festive and ceremonial occasions, it is regarded as essential. Fish, however, is the staple flesh food. In olden times the dog was eaten and, on occasion, man.

FLESH FOODS

Pigs (*pua'a*). Pigs are traditionally stated to have been stolen from Fiji, and were originally known as *so'oso'o,* a term still used in calling them to feed. They were kept in enclosures of fair extent bounded by walls of loose stones and pieces of lava. These enclosures (*pa pua'a*) were at the back of the village or some little distance away. The walls about 4 feet high were crossed in places with stones arranged to form steps, or by a tree trunk with steps cut out of the solid. The pigs were fed sometimes with mature coconuts cut open or other available fruit. Pigs form a source of wealth to a family enabling them to make a good showing at the various functions demanding pork. They are sometimes kept for fattening in small stalls made by crossing horizontal lengths of coconut tree timbers. These are situated at the back of the dwelling house to be near any food left over from the meals. In a well-disciplined community pigs are never allowed to run about the village.

Pigs are killed by strangling immediately before cooking them. They are never killed beforehand and allowed to hang. Climate and custom are against it. They are never stabbed as that would waste the blood. The Samoan attitude is, "Why catch the blood in wooden vessels when the interior of the

pig forms a vessel already." Strangling was executed by holding the pig down on its back, placing a carrying pole or other pole across its throat, and pressing it down on either side. The pig looses consciousness. It is probable that the pig would recover after pressure was removed if disemboweling and cooking did not follow in such rapid succession. The strangling takes place after the oven stones are well on the way to being heated. The pig is singed by rolling it on the hot stones. If the sea is close enough it is washed in salt water.

The lower abdominal wall (*alo*) is cut off, wrapped up in leaves, and sent to the taupou as her official portion. The pig is kept on its back to save the blood which has emptied into the abdominal cavity. The fat from the sides and over the intestines (great omentum) is stripped off, shredded into small pieces, and mixed with the blood in the abdominal cavity. The heart is removed, split, and wrapped up with some fat in a leaf package. All such packages are termed *ofu*. The heart *ofu* (*ofu fa'afale olo*) is for the high chief. The blood mixed with fat is ladeled up into receptacles of banana leaf which are wrapped neatly around the fluid contents. These *ofu* are termed *ofu valevale* to distinguish them from the package containing the heart. There are several of them. They are for distribution among the chiefs and young men who do the work. When cooked the blood coagulates like black puddings. I was at a loss to account for the white material in the cooked packages until informed of the shreds of great omentum. The liver is *mea fono* (for official use) to the talking chief. The intestines and the remainder of the internal organs go to the butchers and cooks. The gullet is removed through a slit in the throat and the removal of the rectum completes the cleaning.

By this time the oven is ready. With the *iofi* tongs, a hot stone is placed in the slit in the throat and another in the aperture left by the removal of the rectum. In a large pig a big stone is placed in the thorax and another in the abdominal cavity. Another may be pushed down into the pelvic cavity. The abdomen is then stuffed with *'o'a* leaves for preference but others may be used. The leaves give the pork a flavor and are termed *lavai*. The method of stealing the first pigs from Fiji may now be understood. The taking of live pigs from Fiji was not allowed, but the Samoans returning home were allowed to take dead pigs as provisions. In the abdominal cavity of a large dead pig, small live pigs wrapped in leaves were used as *lavai*. This enabled them to evade the customs of the country.

Some *'o'a* leaves are spread on the heated stones of the oven. The pig is placed on them with the abdomen downwards. The forelegs are bent back and the hind legs forward under the body. More *'o'a* leaves are spread over the pig and then the usual covering of other leaves. The pig is always cooked whole no matter how large it is.

The cooked pigs are carried whole on poles to the guest house with the other food. In important functions they are heaped together to make a goodly show. In every community there are one or more expert carvers of pigs who delight to exhibit their dexterity. The distributing talking chief may himself carve; if not, he superintends operations. The portions into which the pig is divided have been set by usage. Each part has its name and the person or rank to which each part is allotted is also set by usage. The forequarters, legs, and head are removed and the body and neck divided according to Fepulea'i as shown in figure 72.

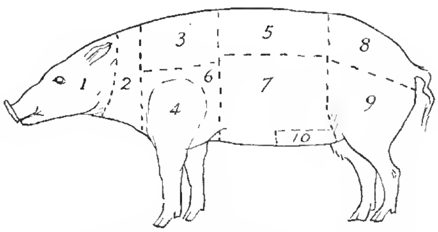


FIGURE 72.—Pig, ceremonial divisions: 1, *ulu* (head) to the *au manga* (young men who cook); 2, *ivi muli ulu* (neck) to the *tulafale* (talking chief); 3, *o'o* (back) to the *ali'i* (chiefs) of second grade; 4, *alanga lima* (shoulder) to the *tulafale* (talking chief); 5, *tuala* (loins) to the *ali'i* of the first grade; 6, *itu mea tele* (big side) to the *ali'i* of second grade; 7, *itu pale asu* to the family of chief; 8, *muli* to the women; 9, *alanga vae* (leg) to the *matai* (chief of lesser rank); 10, *alo* (abdominal wall) to the taupou (village maid).

The ceremonial division of the pig has become such an important social event that it has had an unexpected effect. The actual cooking of the pig has become a secondary matter. If the pig is too well done, the flesh is liable to tear away and the exact boundaries of the ceremonial divisions can not be maintained. This creates adverse criticism and comment on the part of those watching. Instead of an important spectacular success, the division becomes a failure. The failure reflects on the talking chief in charge. He in turn, vents his displeasure on the young men who overcooked the pig. This, by creating a fear of overcooking, has brought about an avoidance custom of undercooking the pig. The cooks often have an argument as to whether the pig is in danger of being overcooked. They may settle it by casting lots. A stick of any length is thrust down into the leaf coverings of the oven. Commencing from below the alternate hand grips are taken on the stick by the two sides. The one desiring the oven to be opened says, "Umu vela" (cooked oven) as he takes his grip. The other grips immediately above saying "Umu mata" (raw oven), and so on up the stick. The one who gets the upper end of the stick wins.

Often the pork is merely warmed through. When the guest receives his share in the guest house he is not compelled to eat it. His correct share has

been given to him which is the all important thing. He may eat a little in addition to the fowl and fish which has fallen to his portion. The remainder he sends home with the rest of his unconsumed portion. The pork is recooked in his home for his next meal. Guests also have it set aside for them, and it reappears at a later meal in a more palatable form.

The appearance of raw pork in feasts is often adversely criticized by people of another race and wrong deductions are made. The pork is not uncooked because the Samoans like raw pork, but because it is necessary to the proper carrying out of the ceremonial division. A failure in ceremony can not be remedied, but underdone pork can be recooked.

The official portions given to high chiefs and talking chiefs are often not meant to be eaten at the time. They are *mea fono* (for official use). Official positions have to be maintained. The ceremonial division has been partly devised to assist them in discharging social obligations. The official portions are recooked for the entertainment of guests and visitors at a later meal. The guests may be neighbors who drop in for a bowl of kava, in which event the chief falls back on his official reserve of pork, and by sharing it with others, not only avoids the stigma of selfishness, but acquires merit. It must be remembered that these portions are not a couple of slices or chops but whole joints. Here again the supposed disadvantages of underdone pork are discounted. The official cutting up of the pig may be compared to the cutting up of joints in a butcher's shop. It is for distribution primarily and not for immediate eating.

Sometimes pigs are cut up into small portions. At Fitiuta in Manua I saw this done with two pigs. Each man got five pieces that came from different parts. This ensured the even distribution of bone and the meat. This method is observed in Safune, Savaii, and has led to the method being termed *fa'asafune* (like Safune).

Fowl (*moa*). Fowls are grilled on the fire (*tunu*) or cooked in the oven (*tao*). For ordinary guests, the fowl forms an economical substitute for the pig. At feasts, they are provided in quantity. The cooked fowl is divided by tearing it apart with the hands. It is never cut. There is a ceremonial division. The only parts that count are the legs. In tearing the two apart, the coccygeal part that carried the tail feathers adheres to one of the legs. That particular leg is called *vae ma le muli,* or *vae ma le no'o,* and it is the correct part for the high chief or visiting chiefs. When Mr. Judd, Mr. Cartwright, and myself went on a journey (*malanga*) around Tutuila, we were served with legs at every village. We formed the idea that the more choice breast and wings were being selfishly kept back. Inquiry into the details of the food complex soon revealed the fact that from the Samoan viewpoint we could not be given anything else but legs. To have offered us the breast would have been lack of respect. The more one is apt to criticise the more interesting will be the in-

formation revealed if it is sought. On the other hand, much of the food ceremonial has been built up around the chiefs by the talking chiefs who superintended food division. When the legs had been torn off for the high chiefs, the talking chief had the rest of the fowl.

Pigeons, doves, tern, and other wild fowl were netted or snared. In any ceremonial division they were treated as fowl.

The turtle (*laumei*). No opportunity occurred for a practical acquaintance with the turtle. Kramer (18, vol. 2, pp. 163, 164) describes the preparation for cooking by cutting through at the base of the neck and removing the intestines and rectum. The heart and other organs were removed through the same opening. The fat and blood were wrapped in leaf packages and cooked in the oven. The entrails were washed in the sea, cooked on the fire, and eaten by the cooks and the chief. In a large turtle, the leaf packages of organs, fat and blood, reached to 150 in number; in a small turtle to 50. Heated stones were placed inside the turtle and a *lavai* of leaves put in. The turtle was then cooked on its back in the oven.

The cooked turtle was taken to the guest house and divided up. The forequarters (*sangamua*), the hindquarters (*sangamuli*), the breast, and abdominal parts were removed. The stones were taken out and the fat cleared away to expose the juice (*suapeau*) within the cavity. The juice was dipped out in half coconut shells, and laid before the chiefs. The parts were then distributed as follows:

Ulu (head)—High chief.
Sangamua (forequarters)—Talking chief.
Sangamuli (hindquarters)—Village maid.
Tua (back)—Young men who did the work.

Fish (*i'a*). Fish abound within the lagoons and form the stand-by of flesh foods. The smaller fish, always cooked in leaf packages (*afi*) were placed unscaled and uncleaned on a banana or breadfruit leaf which was folded over them and perhaps tied with a strip of *fau* bark or husk fiber. Larger fish were placed on a piece of coconut leaf cut to the length of the fish. The leaflets were then brought round the fish from either side and crossed alternately over it as in the commencement of a check braid. This bundle was termed a *fa'alaui'a*. In serving to guests, the packages were placed before them unopened but with any tying strip removed. The guest then had the pleasure of opening his lucky package and seeing what fortune had sent him. The cooked scales are simply pushed aside with the fingers. Entrails are not wasted.

Coconut cream (*pe'epe'e*) may be used by pouring some into the cupped banana leaf with the fish before wrapping it up. The leaf forms an impermeable cover. Cooking curdles the *pe'epe'e* into *fai'ai* and hence the preparation is termed *fai'ai i'a*.

Bonito (*'atu*). Of the larger fish, bonito and shark (*malie*) require special notice. The bonito of all fish is regarded as a chief's fish. A special canoe, rod, and hooks are devised for its capture, and there is much ceremonial connected with it. It is natural therefore that a set division and allocation has become established. The parts are shown in figure 73. The head (*ulu*) is cut off in a vertical line that passes behind the attachment of the pectoral fin. Here again the chiefs were given important parts which they shared at a meal with guests. The bamboo knife used to cut up the bonito was called *manamate*.

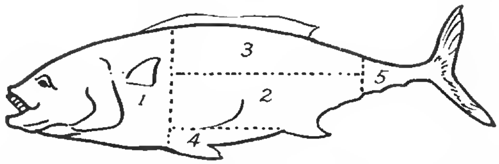


FIGURE 73.—Bonito ceremonial divisions: 1, *ulu* (head) to the high chief; 2, *io alo* (sides) to the talking chief; 3, *io tua* (back) to the other chiefs; 4, *ma'alo* (belly) to be put aside; 5, *si'usi'u* (tail) to be discarded.

The bonito is a favorite fish for eating raw. At Falealupo in Savaii, while being welcomed to the village by the chiefs sitting cross-legged in the round guest house, a chief suddenly raised his head and interrupted the talking chief, who was exercising his function, by an exclamation, "*'Atu!*" The official speech stopped and all present transferred their attention to the *tautai* (head fisherman) of the western end of the village who was approaching with a large bonito. A young man grasped a *laulau* platter from a *fata* shelf and laid it on the floor at the front of the house. The *tautai* laid the present for the guest on the platter amid a chorus of, "Fa'afetai mo le fa'aaloalo" from the assembly. The *tautai* went off and the platter was laid on the ground before me. The speech was no sooner resumed than the same chief again grunted, "*'Atu!*" The *tautai* of the eastern end of the village appeared and another bonito was laid on a waiting platter. This joined its fellow. After the speeches my talking chief, on my behalf, gave one of the bonito to the chiefs present.

The bonito is cut up into small pieces in a large wooden bowl with water in it. Nowadays the juice of limes is added. Portions are then served in half coconut shells. The shells are not specially prepared but are merely those discarded after grating the contents for *pe'epe'e* cream. The bowl is placed at the back of the house with the server sitting behind it as in the serving of kava. Attendants quickly place a *laulau* platter before each guest sitting against their respective wall posts. Another attendant comes around with a basket of cooked food and places a *talo* and breadfruit on each platter. Then a coconut vessel containing the cut-up raw bonito with some of the blood-stained water is given to each guest. If balance is precarious a few stones are

scooped out of the floor and the vessel set in the hollow. The floor mats to provide seating accommodation are around the walls only. The rest of the floor is bare. If, however, the floor is covered, mats are simply pulled aside to allow the hollows to be made. The fish is eaten with the *talo* and the liquid drunk. It is better than it looks.

The shark (*malie*). The flesh of the shark is much prized for eating. The ceremonial surrounding it has also led to set division and allocation of the parts. (See fig. 74.)

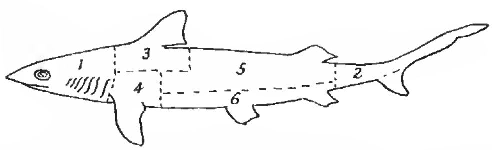


FIGURE 74.—Shark ceremonial divisions: 1, *ulu* (head) to the *taupou* (village maid); 2, *i'u* (tail) to the high chief; 3, *nono* (dorsal fin part) to the talking chief; 4, *au* for official use; 5, *io* (body) for general distribution; 6, *lau alofa* (belly) for lesser chiefs and general distribution.

The head part includes the gills (*aulama*). The tail is cut off from behind the second dorsal fin. The *nono* has its posterior boundary behind the first dorsal fin from which the portion receives its name of *nono*. The lower boundary is at the junction of the pectoral fin. The *io* takes in most of the body. It is split down the middle and each half divided into four parts. The internal parts are divided into the stomach, intestines, and liver. The stomach (*tanga*) and the intestines (*silo*) are regarded as the best parts of the fish. They are shared by the talking chief and the head fisherman, the former exercising the preference. The liver (*ate*) is divided up among the other shares.

When the canoes come in with a good catch the crew shout and wave their paddles to advertise the fact. The villagers gather, the chiefs taking kava root with them. Leone in Tutuila is divided into seven parts. The canoes take their catch to their own part of the village. After viewing the catch, reasonable time is allowed the head fisherman to get cleaned up. The chiefs then go to his house, take up their positions, and present the kava root they have brought with them. As a bowl of kava is being prepared speeches expressing thanks for the good fortune that had attended the fishing are made. The head fisherman sitting at the back of the house replies. If strangers are in the village, they attend and also make speeches. The kava is drunk.

The talking chief now takes charge of the cutting up. The visitors are first advised to wait, generally in another house. The *lau alofa* is generally cooked at once by the young men (aumanga) for a general meal. The chiefs while away the time of waiting in the house by plaiting sennit braid, by conversation, and perhaps another bowl of kava. The allocated official parts

together with portions for the waiters, are taken away to their houses. The head, tail, dorsal fin portion, and *au* are ceremonial shares, not eaten privately, but cooked and brought out at a later meal to which others are invited. Instead of a set meal they can be used at a ceremonial kava drinking with *talo* for supper. As in the allocations of pork they help the chiefs to maintain their position and also the prestige of the village. Where there is no taupou in a village or division of a village, the official share of the head goes to the *aumanga*.

The *laualofa* and perhaps part of the *io* having been cooked, a general meal is partaken of. In this the chiefs share even after shares have been allotted to them. Thus, the body and belly of the fish are for immediate and general use; the other parts for deferred and official use.

Another custom prevails in connection with official shares. Chiefs from neighboring villages, hearing of a catch, may send in and ask the chiefs of their corresponding grades for their official shares. Thus high chief sends to high chief, talking chief to talking chief, and taupou to taupou. This can be done even if visitors from the particular village have been present and have received a share. Such requests may not be denied. The only legitimate excuse is that the shares have already been eaten or given away. This custom shows how official or public the shares allocated to chiefs are and what an important part they play in social organization. The part the talking chiefs play in framing the rules is seen in the allocation of shares. The high chief receives the worst part of the fish in the tail, whereas the dorsal fin portion that falls to the talking chief is the best. Though the talking chief subsequently shares his portion, he has the satisfaction of demonstrating that in some things he exercises more *pule* (power) than his superior. These diplomatic workings of the Samoan mind are fully recognized and retailed by the Samoans themselves.

The fresh water eel (*tuna*). The tail part goes to the chief.

The squid (*fe'e*) is a delicacy eagerly sought after by women at low tide with sticks for poking them out of holes in the reef, and at high tide by men using squid lures from canoes.

The proper method of cooking is termed *fai'ai fe'e*. The dark liquid contained in the squid (*taelama*) is expressed and mixed with coconut cream. The tentacles are cut into short pieces and together with the cream mixture are wrapped up in banana leaf packages and cooked in the oven. Sometimes *talo* leaves are included in the package.

Crab (*pa'a*) may be cooked plain or with coconut cream in a package to form *fai'ai pa'a*.

Dogs (*maile* and *uli*). Pratt (23, p. 62) gives the form *uli*, but there is little doubt that it should be *'uli* as *kuri* is the Maori and Rarotongan word for dog. Stair's contention (33, p. 187) that the word is derived from *u*, to bite

and *li*, to show the teeth, does not seem to fit the case. He states that the native dogs were a small breed with sharp pointed ears, but he saw only one wild one in the distance. Judd (17, p. 16) draws attention to the dogs seen in Tau, which has been fairly isolated as regards the introduction of animals by later foreign residents. He says the dog has a queer yap, slender legs, long body, pointed nose, and bat ears. They were also fed on coconuts and it seems possible that they are descendants of the Polynesian dog. Samoans of the present day are loath to admit anything that may render them subject to criticism of a disparaging kind, though why the eating of dog's flesh should be considered a disgrace to a people with a limited supply of flesh food is more than a rational person can understand. However, Stair (33, p. 187) states: "Dogs were formerly eaten by the Samoans, as at other islands: of late years, however, the practice has been discontinued."

Man. The remarks about dogs apply with greater force to human beings as a source of food. Practically all branches of the Polynesians except the Maori, Cook Islanders, and Marquesans, deny that their ancestors ate human flesh. The virtue claimed has been somewhat due to the condemnation of the practice by foreign teachers who came from countries abounding in beef, mutton, and other flesh foods. Their ancestors had no lack of different kinds of flesh foods to give them variety in their diet. It is, perhaps, natural for those who never felt the physiological need, to condemn a practice without considering it from a purely dietetic point of view. The acceptance of modern ideas beclouds the issue and leads to the forgetting of things now regarded with disfavor. While the Samoans did not replenish their larder with human flesh as a general custom, their traditional narratives contain individual instances of anthropophagy. One of the Malietoa was supplied with human victims regularly, until a shock made him give up the practice. The shock was due to his own son having taken the place of a living victim in a coconut leaf bundle that was delivered before him and opened up in his presence. The custom of a lesser chief saving his life by making abject apology and submission by being tied up in coconut leaves, carried on a pole and deposited before his more powerful neighbor as food goes back to a period when the eating of human flesh prevailed more than in later years. It was also the custom to take the wood and stones for the oven along with the individual making submission. The tendency now is to treat the custom as a metaphorical abasement in which the person likens himself to a pig, but more probably it had a literal significance.

VEGETABLE FOODS

Vegetable foods form the larger part of the diet. Except for coconut, breadfruit, and banana, they consist of root crops in the form of *talo*, yam, and to a smaller extent, *umala*. Of these the *talo* is by far the most im-

portant. The coconut is extremely important as it enters into most of the compound dishes made with all the articles quoted above. As regards green vegetables, *talo* leaves formed the only kind used. The number of preparations are confusing unless taken under each food heading. The coconut is dealt with first to prepare the way for its combinations with the other foods.

The coconut (*niu*). The mature nut is called *popo* and the less mature drinking nut, *niu*. The outer husk is *pulu*, the shell *ipu*, and the meat *'a'ano*, the outer rind of the meat *tuatua*, and the liquid *sua*. The end of the husked nut showing three round depressions is called the *mata* as against the other end (*muli*). The *mata* (face) is so named after Tuna, the unfortunate eel lover of Sina. His dying request of Sina was to have his head cut off and planted. From it grew the first coconut palm in Samoa. Of the three depressions, the two which are close together are called *sisi*, while the other apart, is also the *mata*. A leaflet midrib can be pushed through the *mata* depression to form a hole through which the liquid may be drunk. This hole is also opened up to prepare coconuts as water bottles. The *sisi* depressions can not be perforated with a piece of midrib. The *muli* ends in a sharp point. This part is tapped round its circumference with a stone or knife to crack the shell, and thus enables a circular piece (*ta'e*) to be removed to give better access to the drinking fluid. Where no implement is handy, a nut may be cracked around with the *muli* point of another unopened nut. The green husk of a particular kind (*utongau*) is chewed for its sweet taste. The *sua* liquid forms a refreshing beverage freely offered to guests in lieu of, or as well as, kava. Unless trees are prohibited by particular warning marks, travellers have the right to take a few drinking nuts from any wayside trees, but they must not abuse the privilege. The flesh, both immature and mature, is used as food, either uncooked or in the following preparations.

1. Coconut cream (*pe'epe'e*). The *popo* mature nut is husked, split and grated on the *tuai* grater. The grated *penu* is wrung and strained through a *tauanga* strainer as already described. The resultant creamy liquid is the *pe'epe'e* so much used and appreciated in Samoan dishes. It may be used directly as with banana poi or undergo further treatment.

2. Sauce (*miti*). The *pe'epe'e* is mixed with sea water (*sami*) to form a relish in which food is dipped during meals. Nowadays fresh water and salt may be used instead of sea water, and sliced onions added. The juice of limes or lemons is also added. The *miti* may be kept in a coconut water bottle. For use, some is poured out into a half coconut shell or into a hollow formed with the *afei* leaves that accompany the food. It is used with raw mullet and cooked fish.

3. Thickened *pe'epe'e* (*fai'ai*). The *pe'epe'e* may be cooked by itself in a wrapper of banana leaf. It thickens like curds and is called *fai'ai* or *fai'ai fua*. Again it may be cooked with other foods such as *talo*, yam, *talo* leaves, fish and crab. To all these preparations, the name of *fai'ai* is given with the particular food as a qualifying term such as *fai'ai talo*, *fai'ai ufi*, *fai'ai i'a*, and *fai'ai pa'a*. The exception is the preparation with *talo* leaves which receives the specific name of *lu*.

The *pe'epe'e* is also heated by adding hot stones to it while in the bowl. One stone is sufficient to bring out the slightly burned smell and flavor so much appreciated. In

Savaii and Upolu it is usual to place a hot stone on the grated nut (*susunu ai penu*) and express the liquid after. This is the stage used for the *talo* leaf preparation (*palu sami*).

4. Curdled *pe'epe'e* (*vaisu*) goes a step farther than the above. Hot stones are placed in a bowl containing *pe'epe'e* until it curdles. It may now be cooked with fish to flavor them. Note that *fai'ai* is curdled by the heat of the oven during cooking, whereas *vaisu* is curdled before the package is placed in the oven.

5. What is termed *niu tolo* carries on from the *vaisu* preparation. Hot stones are added until an oil separates from a brownish cooked precipitate. The sweet precipitate (*tae i'a*) is usually eaten by the cooks, while the oil (*siu tolo*) is used with the *talo* preparation known as *fa'ausi.*

6. A preparation (*vaisalo*) is usually made for sick people, but not necessarily confined to them. A nut, not too mature, is opened at the *muli* end and the fluid poured into a bowl. The circle of removed shell (*ai sali*) may be used instead of the fingers to scrape out the meat into the bowl. The meat is rubbed small (*vavau*) with *alava* strips and the liquid wrung out into the bowl. When nothing but liquid is in the bowl hot stones are added until it is cooked and forms *vaisalo.* A *tolo* stirrer is used while the cooking is proceeding. In some preparations, the small particles of coconut meat are allowed to remain with the fluid.

7. An evil-smelling, but palatable preparation (*sami lolo*) is usually a by-product obtained while preparing coconut shell water bottles. A large mature nut is pierced through the *mata* hole, and the liquid poured out. The shell is filled with sea water (*sami*), corked with a folded strip of dry banana leaf, and left for a fortnight. The water is then poured off, and the meat, which has become soft, is shaken out. When this is cooked with *talo* leaves in a package it is known as *sami lolo.*

The talo (*Colocasia antiquorum*) is the staple vegetable food of Samoa. It takes easy precedence over the breadfruit, yam, and sweet potato. Its ceremonial status is high in that it forms the correct vegetable to serve to high chiefs. The *talo* preparation of *fa'ausi* is also made the most of in serving before guests. The leaves provide the only green vegetable used. The large *ta'amu* species is sliced to remove the skin, and never scraped. Slicing removes the astringent and irritating properties more effectively.

1. *Talo tao.* The *talo* scraped with an *'asi* scraper, cooked (*tao*) in an oven without any individual leaf wrappings, is the general form of cooking.

2. *Talo fa'ataisi.* The scraped *talo* is divided longitudinally into two or three parts according to the size of the *talo.* Ti leaves are used as wrapping to form a package (*taisi*). The division into smaller pieces ensures their being cooked through the wrapping. When cooked, the *talo* is cleaner and whiter in appearance than the ordinary *talo tao.*

Fai'ai talo. Coconut cream is wrapped up with the *talo* in the leaf package, in which it curdles and thus forms *fai'ai talo.* Two preparations are distinguished according as the *talo* is ungrated or grated.

3. *Loloi.* The *loloi* is *talo fa'ataisi* (2) to which coconut cream is added before cooking. An alternative name to *loloi* is *fa'alifo talo.*

4. *Fai'ai valuvalu.* The uncooked *talo* is grated (*vavalu*) on a slab of coral (*lapa*) and then wrapped up in a leaf package with coconut cream. Owing to the softer nature of the grated *talo,* the package is flatter and smaller than a *taisi* package. This form of package is called *fa'apāpā.*

5. *Fa'ausi talo.* Grated uncooked *talo* sufficiently moist without the addition of water, is made up into flat cakes and wrapped up in leaves to form *fa'apapa* packages. Kramer (18, vol. 2, p. 151) states that the leaves of the *laumapāpā* fern (*Asplenium nidus*) are also used as wrapping. Coconut cream is not added to the packages before cooking. When cooked, the flat cakes are cut up into fair-sized cubes and put in a wooden bowl with the oily preparation of coconut cream known as *niu tolo.* It is served with some of the oil. The importance with which *fa'ausi talo* is regarded is dealt with under ceremonial

observances. Two forms of the preparation are recognized: *fa'ausi malaulau*, when the *fa'ausi* is made hot or immediately after the grated *talo* cakes are cooked; *fa'ausi fua fulu*, when the cubes are cut from cold cakes cooked overnight.

6. *Taufolo talo*. This preparation was not mentioned to me but was described in details by Kramer (18, vol. 2, p. 151). The cooked *talo* is peeled and mashed with the butt end of a piece of coconut leaf midrib (*'ulu o le lapalapa*). It is served with coconut cream.

Leaves. The leaves used are those near the growing center which being folded in, are termed *moemoe*. The older, fully opened leaves do not soften into a pulp, but remain tough, and have an irritating astringent effect on the mouth and throat. Four methods of cooking the leaves (*lu'au*) and one of the leaf stalks (*fa*) are in vogue. Pratt (23, p. 62) gives *ulu'au* as a synonym of *lu'au*. Here *ulu* means the end away from the *'au* or stalk and *lu'au* is evidently a contraction.

The wrapping for *talo* leaf preparations is banana leaf which, by being heated over hot stones, is toughened and forms an impervious cover through which the liquid coconut cream can not soak.

Smaller packages of *talo* leaf come under the general term, *'ofu*. The neat manner in which the leaves are prepared is described by Handy (14, p. 20).

> From the neat pile of *talo* leaves one leaf is selected and placed face downwards on the palm of the left hand. While the right hand fingers pinch off the tip of the leaf, the left breaks the midrib about an inch above the stem. Thereupon the right hand pinches out the butt end of the midrib from this break to the end of the stem and throws it away. The two lower lobes of the leaf are now torn off and the three sections resulting are placed on the pile ready for filling with coconut milk.

The assembling of the package takes place in the cooking house when the oven stones are heated. The wooden bowl containing the prepared coconut cream is brought in and a hot stone is dropped into the liquid to bring out the odor and taste. In the Savaii method, this is done by dropping a hot stone into the grated nut before wringing and straining. Five or six pieces of *talo* leaf are laid on the palm of the cupped left hand which raises the edges of the leaves to form a receptacle for the coconut cream. A sufficient quantity of cream is dipped up with a half coconut shell and poured into the leaf hollow. The sides of the leaves and then the ends are neatly folded over so as to enclose the liquid. An assistant who has warmed a section of green banana leaf on the hot stones (*lalangi lau fa'i*) hands it over. Upon the side of the leaf section, the natural concavity of which is increased by the heat, the leaf package is laid. The sides and then the ends of the banana leaf wrapper are folded over the *talo* leaves, and the augmented package laid on the upper surface of a green breadfruit leaf. The sides of the leaf are folded over so as to overlap, the tip end of the leaf is folded in to the middle, and lastly the stalk end turned forward over the tip. The leaf stalk is pinned through the tip end by passing down through the leaf on one side of its midrib and

up through on the other. The *'ofu* package is thus neatly and deftly folded and securely fastened.

When the food is placed on the prepared oven, the *talo* leaf packages are placed round the circumference. They require less heat to cook and must not have fish or flesh placed above them lest the distinctive flavor of the vegetable be affected.

On cooking, the *talo* leaf pulps into a soft mass mixed with the coconut cream. In serving, attendants remove the outer breadfruit leaf covering but the banana leaf is left as a receptacle which the guest opens out himself.

1. *Potoa.* The *lu'au* leaves are cooked without any coconut cream. They are folded in a package and may be covered merely with a large piece of *talo* leaf, as the impervious banana leaf is unnecessary where no liquid is used.

2. *Lu.* A larger package than usual is formed of *lu'au*, coconut cream as treated above, and banana and breadfruit leaf covers. Kramer (18, vol. 2, p. 147) gives the name of *fa'afatupa'o* for this preparation.

3. *Palu sami.* This favorite preparation is made exactly like *lu* but in smaller packages while sea water is added to the prepared coconut cream to give it a salty taste. The sea water may be added to the grated nut before the cream is expressed. A metaphorical name is *'oto ma le sau* (plucked with the dew) inferring that the leaves were plucked while the dew was on them.

4. *Lu'au fui.* Coconut cream is not used but a little sea water is poured into the cupped *lu'au* before wrapping with the two leaves.

5. *Fa.* The stalks (*fa*) of the *talo* leaves are peeled and wrapped in a package without the addition of coconut cream or sea water. The preparation may be made more palatable for sick people by adding coconut cream with sea water, which Kramer's informant referred to as *sua palusami*.

No meal is complete without a preparation of *talo* leaf. Of these, *palu sami*, is easily the most in demand. In recent times salt is often added to the *talo* leaves in place of sea water. The use of sea water dates from a period when other forms of salt could not be procured. The *lu*, with coconut cream alone, is used more in inland villages where sea water is not available.

In Manua, the pinching off of the tips of the *talo* leaves is said to commemorate a historical incident that ocurred between Tangaloa and Pava in a kava-drinking ceremony. (See p. 153.)

The breadfruit (*'ulu, Artocarpus incisa*). The breadfruit stands next in importance as a food to *talo*. The name *'ulu*, with dialectical letter changes as *'uru, kuru*, is found throughout Polynesia. It occurs in Maori traditional history as *kuru* and formed one of the causes of strife in the Society group before the Maori left for New Zealand. The tree is grown round the villages and in the plantations. The fruit is picked with a long pole picker. The Samoans do not care for the ripe or over mature fruit. When so eaten, it is from force of circumstances and not preference. The outer rind is scraped off with an *'asi* scraper before cooking. Medium sized fruit is cooked whole, but large ones are split in two or in thirds with a characteristic wooden splitter (*to'i pua*). Of the food preparations, *taufolo* ranks high. In abun-

dant seasons, the surplus supply is stored in pits, more as a means of preventing waste than any particular liking for the fermented food (*masi*). It is then used in times of scarcity or while working in the plantations where the pits are made.

The leaves are used as oven covers, outer wrappings for *'ofu* packages, and as platters upon which food is served. As platters, the *ma'opo* nonpinnate variety is used.

1. *'Ulu tao.* The scraped fruit cooked without wrappings in the earth oven is the common mode of preparation.

2. *'Ulu tunu.* The scraped fruit may be cooked on the embers of an open fire for one or two people to save preparing the earth oven. It is cooked on the heated stones of an earth oven without cover for the *taufolo* preparation. Both forms are *tunu* as opposed to *tao*.

3. *'Ulu pe'epe'e.* When *'ulu tunu* is peeled with a *fofo'e* peeler, it may be eaten with coconut cream. The breadfruit so cooked is usually more mature than those cooked in the oven.

4. *Taufolo 'ulu.* Though *taufolo talo* has been mentioned the term *taufolo* is usually associated with breadfruit. The slightly more mature fruit is cooked on the open heated stones of an earth oven, but no cover of leaves is placed over it. The charred rind is removed with *fofo'e* peelers and the cooked fruit placed in a wooden bowl. It is mashed with the *autu'i* pounder made of uncooked breadfruit, and the core (*fune*) and immature seeds (*fatu*) flicked out with a piece of wood known as an *i'o fatu*. See Plate VI, *C*. When mashed to a consistent mass, coconut cream is added to the bowl and two forms are named: *a. taufolo niu,* when the coconut cream has been merely heated with a hot stone to bring out the flavor; *b. taufolo sami,* when a little sea water is added to the coconut cream. The mass is divided up by pinching off smaller pieces with the fingers (*fifi*) and squeezing or rolling them into balls. The pinching off and rolling is quickly done as the mass is hot. The preparation is served on *maopo* leaves with some of the coconut cream. The *taufolo* figures as a food for special occasions.

5. *Masi.* The surplus breadfruit that has been fermented in a store pit is termed *masi*. Pratt (23, p. 193) gives an example of name avoidance in a district where owing to the chief's name being Masi, the fermented breadfruit was called *mamala*. The pit (*lua'i*) is lined with coconut leaves and an inner layer of banana or *laufao* leaves which are called *afei*. The mature breadfruit, often unscraped, is thrown into the pit. Fruit that is too ripe is not favored even for *masi*. The large fruit may be split. The pit is then covered to exclude the air. It will keep in the pit for a year or more.

The fermented *masi* is crumbled with the hands (*nguti*) and kneaded into cakes in a wooden bowl dry or with a little water. The *fune* has softened during fermentation, but the hard *fatu* seeds are picked out. The cakes are cooked in the earth oven with or without leaf wrappings. The latter is termed *masi afifi*. Besides this plain mode of preparation, there are three others: *a. masi palu,* when the *masi* is mixed with coconut cream before cooking in a wrapper of leaves—the cream makes the dish softer (*palu*); *b. masi penu,* when the *masi* is mixed with grated coconut (*penu*) before cooking; *c. masi tao 'ato,* when the kneaded *masi* is cooked in a basket (*'ato*) to provide quantity. It is hard but keeps for a long time. It forms a useful reserve food to take on journeys. The rations are broken off as required. This *masi tao 'ato* was also a useful provision on sea voyages.

TRADITION OF FIRST MASI

At Neiafu in Savaii, a small hole in the rocks about 2 feet in diameter and 2 feet deep, is pointed out as the first pit (*lua'i masi*) used in Samoa. A crippled couple named Ui and Tea had a daughter Sina who was taken to wife by the god, Tangaloa-langi.

Owing to her parents not being able to get the breadfruit down from the trees, Sina brought them the *tuaoloa* (east) and *to'elau* (N.E. trade) winds to bring down the fruit for them. The two winds failed to bring down sufficient fruit, much to the crippled couple's disgust. In answer to their complaints, Sina sent the boisterous *la'i* (west) wind which effectively brought down the fruit. The old couple, at last satisfied, gathered the fruit and stored the excess quantity in the hole alluded to, where it became converted into *masi*.

The *to'elau* trade wind ushers in the good season in Samoa and brings gladness to all. The old couple, however, were the exception, and complained about the *to'elau* because it did not serve their immediate single need. Hence the saying: "Na'o Neiafu ua mele ai le to'elau" (only Neiafu despises the trade wind).

The yam. The yam (*ufi*) though favored as a food, does not enter into the Samoan food complex in the same way as the *talo* and the breadfruit. It is much scarcer. This is partly due to the greater labor entailed in its cultivation. Its status is high, for one informant coupled it with *talo fa'ataisi* among the four requisites for a visiting chief's meal. In his list he retained the drinking coconut and the fowl, but left out the pig, and placed the yam before the *talo* in order of precedence. It is thus evident that the yam ranked high where pigs were scarce. The yam preparations are exactly similar to those of *talo* except that *fa'ausi* was confined to *talo*.

1. *Ufi tao.* The scraped yam was cooked in the oven, *tao*. Small ones could be cooked whole, but large ones were cut into appropriate sizes to ensure being cooked.
2. *Ufi fa'ataisi.* The same as with *talo*. The term *taisi ufi* is also loosely used. The coconut cream *fai'ai* is also used in a similar way.
3. *Loloi ufi* or *fa'alifo ufi*, where the *pe'epe'e* is added to the whole or divided *ufi* and cooked with it.
4. *Fai'ai valuvalu ufi*, where the *pe'epe'e* is added to the *ufi* grated in the same way as *talo* and then cooked.
5. *Sofesofe.* This is a variation of the *fai'ai* preparations. The yam is cut up into smaller pieces and cooked with *pe'epe'e*. It is thus intermediate between the two preceding preparations. Kramer (18, vol. 2, p. 153) terms this preparation *loi ufi*.

The sweet potato (*'umala, Ipomea batatas*), important in other parts of Polynesia, has little status in Samoa. Both breadfruit and banana are more important articles of diet. The sweet potato was said to be eaten when there was no other choice. On Olosenga where they were seen growing, they had been planted as a substitute for *talo* which had failed through a severe storm. They thrived in the sandy soil and were of good flavor. Even then the people apologized for having to use them. The preparations made with *talo* and yam could be made with *'umala* but the impression given was that any such trouble was not justified. Kramer (18, vol. 2, pp. 146-157) in his list of 29 vegetable food preparations does not give a single dish in which the sweet potato was used. It, like the ripe breadfruit, was said to be too sweet. Contrasted with this statement, the sweetness of the ti and the sugar cane is sought after. Sugar is greatly appreciated and even high chiefs will accept a present of a couple of pounds of sugar with alacrity, and not consider it derogatory to their dignity.

The banana (*soa'a* and *fa'i*). The banana is divided by the Samoans into two main groups; the *soa'a* (plantain) and the *fa'i*. Ripe bananas are eaten as a fruit. Green bunches are picked and ripened more quickly by dipping them in sea water before hanging them up or by putting them in a pit. The process of ripening in a pit is termed *fa'aotanga* and the oblong shallow pit, *lua'i fa'aotanga,* or *lua'i fa'avevela.* The pit is lined with dry banana leaves, and the bunches covered with more leaves. Sometimes a couple of pieces of dry coconut husk are lighted and left in with the bananas. Some cross pieces may be placed over the hole, and coconut leaves and earth complete the covering. Ripe fruit is also made into a thin gruel (*poi*) and surplus stock into *masi fa'i.*

As a food, however, bananas are highly esteemed as a cooking vegetable to eat with flesh foods. The best kinds are the *fa'i pata* and the recently introduced *fa'i papalangi* (Cavendish).

1. *Fa'i tunu.* The unripe unpeeled fruit is cooked on the open embers of a fire generally in the cultivations to avoid the trouble of making an *umu.*

2. *Fa'i taopa'ua.* The unripe, unpeeled fruit is cooked in the oven on a layer of leaves to prevent scorching.

3. *Fa'i tao malaulau* or *tao fofo'e.* The unripe bananas are peeled with the *fofo'e* peeler before cooking in the oven. They are sometimes thrown into a bowl of sea water as they are peeled. This is the commonest form of cooking. The cooked bananas are somewhat hard, but the Samoans are very fond of them.

4. *Fa'i oloolo.* The peeled unripe bananas are grated (*oloolo*), wrapped in banana leaf in flat packages (*fa'apapa*), and cooked in the oven. Coconut cream may be cooked with it. Formerly the bananas were grated on *lapa* coral but now perforated tin is used.

5. *Sua fa'i.* Thin slices with a little water are wrapped in warmed banana leaf and cooked in the oven principally for sick people and invalids. The iron pot is now used.

6. *Loi fa'i.* This is a *fai'ai* preparation, the peeled unripe bananas being wrapped in banana leaf with coconut cream and cooked.

7. *Sai fa'i.* Ripe bananas are peeled and dried in the sun. They are then wrapped in dry banana leaf (*sului*) and bound (*saisai*) closely round and round as in the modern preparation of native tobacco. The bundle of preserved banana is called a *sai fa'i.*

8. *Masi fa'i.* The *masi* is made of peeled ripe bananas stored in a pit in the same way as breadfruit *masi.* As with breadfruit, it is only done when the crop is so abundant that it can not otherwise be disposed of. The banana *masi* I tasted in Olosenga was cooked in flat leaf packages in an *umu* by a working party on a cultivation. Though somewhat tough, it had a pleasant taste, and the odor was not too pronounced. It is admitted that banana *masi* is probably modern and has not an ancient origin like breadfruit *masi.*

9. *Poi.* Ripe bananas are peeled and placed in a wooden bowl with water. The fruit is mashed with the knuckles (*tu'itu'i*), squeezed between the palms (*'o'omi*) and between the fingers (*lomi*) to produce a thick gruel to which coconut cream and the juice of a lime (*tipolo*) are added. Before the introduction of limes, the leaves of the *moengalo* shrub were used for flavoring.

The *poi* is prepared publicly at the back of the house like kava by a garlanded girl or youth sitting behind the bowl while assistants peel the bananas and drop them into the bowl. The *poi* is served in half coconut shells from the discards of grating coconut cream. Each person gets an individual cup without set order of precedence or official calling of names. The attendant starts at one end and works around in the order in which the chiefs are sitting. Usually two or more young men serve as quickly as

possible, and fill other shells with which to replenish the empty vessels. Serving goes on until the bowl is empty. The *poi* often takes the place of an ordinary brew of kava, but never in proper ceremonial. To show attention to a guest, a chief will often bring in a ripe bunch of bananas to be made into *poi* which he waits to share as a further sign of attention.

Plantains (*soa'a*) are preferred to bananas for cooking, but they are not so plentiful. They may be grilled (*tunu*) or cooked in the oven (*tao*). They are used at a riper stage than bananas and always with the skin left on. Cooked ripe *soa'a* are held to be good for children.

Plantains cooked with coconut cream in a package are termed *loloi*. The grated form of *oloolo* is made as with bananas. A *fa'ausi* of plantain is also made by serving the cooked grated fruit in the oily coconut preparation *tolo niu* as in *talo fa'ausi*.

Arrowroot (*masoa, Tacca pinnatifida*) is cultivated, the roots grated on a sennit grater, washed, and decanted in special large bowls called *tanoa masoa*. The prepared material is cooked in three ways.

1. *Fai'ai vatia*. The arrowroot is mixed with coconut cream in a bowl, made up in packages in banana leaf and cooked in the oven.
2. *Piasua*. The arrowroot is mixed with water in a bowl and heated stones dropped in. It is stirred and coconut cream added. When cooked, the mass is clear and gelatinous. It is cut up into smaller pieces with a strip of *alava* from the back of the coconut leaf midrib. It may be served with coconut cream.
3. *Vaisalo*. To the *vaisalo* preparation (see p. 129) arrowroot may be added by crumbling it in as the heated *vaisalo* is stirred. The mixture, although referred to as *vaisalo*, is really a mixture of *vaisalo* and *piasua*.

Turmeric (*malasina*). In the preparation of turmeric from the roots of the *ango* (*Cucuma longa*) a stage is reached where the lighter *lenga* to form the yellow dye is separated from the heavier part known as *malasina*, which is used as a food and is prepared in two ways: 1, *fai'ai malasina*, when the *malasina* is mixed with coconut cream, wrapped in warmed banana leaf, and cooked in the oven; 2, when heated stones are dropped into a bowl containing the *malasina*. The *malasina* is stirred and it thickens as it is cooked. No special name was obtained for this preparation.

Papaia (*esi, Carica papaya*). The papaia is eaten as a fruit but is not greatly in favor. The fact that it is appreciated by foreigners is well known. Thus during the Bishop Museum expedition in Tutuila papaia were frequently brought during the ceremonial presentation of food by women. Two forms of cooking are noted:

1. *Fai'ai esi*. The peeled papaia is cut into quarters, wrapped up in banana leaf with coconut cream and cooked in the oven.
2. *Sua esi*. Thin slices of papaia with water were wrapped in banana leaf and cooked in the oven. As in the case of banana *sua fa'i*, a pot is now generally used. The food is for invalids, and coconut cream may be served with it. This form is described by Kramer (18, vol. 2, p. 151).

Seaweed (*limu*). Seaweed is eaten raw. It is also cooked for invalids and old people. In *fai'ai limu,* the seaweed is washed with fresh water in a wooden bowl. It is then wrapped in banana leaf with coconut cream and cooked in the oven. It forms about the only alternative to cooked *talo* leaves.

The ti (*Cordyline terminalis*). The underground stem of the ti, especially the *ti manu ali'i* and *ti vai,* were cooked for the saccharine material contained therein.

In making *umu ti* a very large oven (*umu ti*) is prepared communally by the village (*nu'u*). The families dig up the stems and bring them in baskets to the common oven. The oven is dug out to about 10 feet in diameter. Larger stones than usual are heated on a fire made of logs. The leveling of the stones takes some trouble. Six or more men dressed in ti leaf kilts and wreaths do the work with long poles (*sosofa*). Sometimes a heavy log tied with ropes is dragged from side to side. The levelled stones are covered with the leafy heads of the ti. The underground stems, still in baskets, are placed in the oven in the parts assigned to the different families. They are next covered over with more leaves and buried with earth. The oven is left covered for a week or even longer. When it is opened, the families take their own baskets. The outer bark is removed. The cooked ti can be chewed direct. From its fibrous nature and sweet taste, it somewhat resembles sugar cane. No ceremonial detail was obtained, although it existed in the past.

A preparation (*otai*) is made by using the liquid from a green coconut, the grated *penu* of a mature nut, and cut up pieces of cooked ti.

Sugar cane (*tolo*). Sugar cane was primarily grown for thatch, but now some kinds are grown for their saccharine properties. Lengths of thick cane are often brought in with the food for visitors. The outer skin is peeled off and the cane chewed.

The candlenut (*lama, Aleurites molucanna*). Though used for lighting and to obtain carbon, candlenut does not seem to have been used as a relish, as it is in Hawaii.

RESUME OF COOKING PROCESSES

From the detailed enumeration of the cooking recipes, an idea can be formed of the comparative values of the different foods and the uses of the various utensils in Samoan domestic economy.

The outstanding value of the coconut in cooking is evident. In some form or other it enters into combination with every vegetable food and most marine flesh food except the larger fish. The meat of the immature nut and the liquid enter into *vaisalo* and *otai.* The grated mature nut is used with *masi penu* and *otai.* But it is the expressed coconut cream that is invaluable in so many preparations. Cooked with them as *fai'ai,* it enters into 17 different dishes. As the oily *niu tolo,* it is indispensable to the most important made up dish, *fa'ausi.* It provides the only sauce for meat, vegetables, and puddings. Without the coconut, Samoan cooking would be resolved into its primary elements.

The *talo* demonstrates its position as the chief vegetable. It provides the basis of the Samoan diet, the most valued chiefly dish either as *talo taisi* or *fa'ausi talo,* and the only green vegetable.

The method of cooking in the oven (*tao*) is the essential one with all foods. Grilling (*tunu*) has a limited use. The method of heating by adding hot stones to a liquid contained in a wooden bowl is seen, however, to be important. It enters into the heating of coconut cream for *palu sami* and *fa'ausi talo,* two very important dishes. It is used in one form of breadfruit *taufolo,* next in importance to *fa'ausi talo* from a ceremonial point of view. It is the cooking method in coconut *vaisalo,* arrowroot *vaisalo, piasua,* and the turmeric *malasina.* Both *vaisalo* and *piasua* are invaluable foods for the sick. The use of the wooden bowl as a cooking vessel in this method must also be noted. Likewise the *iofi* tongs receive additional use. The use of the impervious banana leaf wrapper around food containing liquids must be stressed. It is a primitive form of broiling—a process within a process. The entirely liquid coconut cream and pigs' blood is thus cooked without a vessel even of wood.

Of the domestic utensils, the *tauanga* strainer is indispensable in the preparation of the extensively used coconut cream. The *alava* only comes into use with the preparations in which immature coconut meat is used.

The coconut grater is also indispensable. The coral grater is seen to have had more use than might be apparent at first thought. It was formerly used with uncooked *talo* to prepare *talo valuvalu,* and *fa'ausi talo,* and uncooked yam for *ufi valuvalu,* and with the banana and plantain for *fa'i oloolo, soa'a oloolo,* and *fa'ausi soa'a.* The sennit grater enters only into the preparation of the turmeric *malasina.*

As regards pounders, the two forms have only one use each; the green breadfruit *autu'i* for breadfruit *taufolo,* and the coconut leaf midrib *ulu lapalapa* for *talo taufolo.* Breadfruit *taufolo,* though important for guests, plays no continuous role in every-day diet.

MEALS

The Samoans are very early risers. When busy with their cultivations they go off at daybreak without having any set meal. If there are any cooked *talo* or breadfruit left over from the previous day, these may be eaten. They return about 10:30 or 11 A. M. with a load of *talo,* breadfruit, or bananas. The oven for the morning meal is then prepared. This is a hearty meal and combines the morning and midday meal of three-meal races. Enough is usually cooked to provide for the evening meal. Thus, besides the vegetables, extra packages of fish and *palu sami* are cooked. These remain unopened.

The evening meal usually takes place after sunset. On my remarking that it was a good time, as the flies had retired, I was assured that that was one

of the reasons for holding it at that time. It is the most convenient time, as the men have finished fishing and their other duties about the village, and have bathed. Dressed in clean *lavalava* kilts they are prepared to make themselves comfortable. In these days, family prayers are held and the meal follows immediately after. With visitors in the village, a fresh meal is cooked in the evening as also when food is plentiful.

If food is plentiful, three meals are partaken of, one being cold. The people are not slaves to the conventions of time. If a good catch is taken of a particular fish that is in season, they are cooked and partaken of as soon as the fishing activities are over. On divers occasions, snacks are disposed of. Several helpings of banana *poi* form a small meal in itself. The women often go down fishing among the rocks, and take cooked banana or *talo* with them to eat with raw fish. Single dishes such as *piasua* or *vaisalo* are often partaken of without relation to a regular meal; so also is the small repast of shark or pork with the drinking of kava. The custom of two meals a day may be regarded as being influenced by food supplies and not by any dietetic rules. There is a readiness to eat and feast at any time should food be available. There is a tendency to overeat and to encroach on what was cooked for two meals. The lack of secure storing places and the availability of the cooked food baskets is against the careful conservation of food. This somewhat wasteful tendency was observed in ancient times by Le Polo of Amouli in Manua. He built a stone platform called a *pae* where he sat as the villagers returned from their cultivations. Upon the *pae*, he made them deposit one-half of the food they were bringing in. When asked the reason, he replied with one of those trite sayings so much admired and quoted by the Samoans: "E nanea mea mata, ae le nanea mea vela." (Uncooked food will last, but cooked food will not last). The people returned for the rest of their food on the following day. Le Polo's precaution thus prevented their running short on the second day. The stone platform sufficiently large to accommodate the villager's food is still to be seen at Amouli and is known as Le-pae-o-Le-Polo.

The basis of the diet is a vegetable one of *talo* and breadfruit. With this is required an *ina'i* or relish of another kind of food such as flesh or fish. Fish is the staple *ina'i*. Equally important is the green *talo* leaf vegetable especially in the form of *palu sami*. Flesh and fish are not always procurable. A Samoan will then make a satisfactory meal of *talo* and *palu sami*. The salt and coconut cream in the *palu sami* afford the *ina'i* relish. By acting as a psychological substitute for flesh foods *palu sami* saves the position, and ranks as one of the most important articles in the Samoan dietary. Water is the universal beverage. Kava is never drunk with regular meals though it may precede them.

SERVING

For ordinary scratch meals, women may be seen eating out of a basket. For men, the food is properly served on *laulau* platters. The platters are flat, oblong trays made of coconut leaflet, and form part of the essential furnishings of dwelling and guest houses. The young men or women serving the food bring down a pile of platters from the *fata* shelf and place them beside the baskets of cooked food at the back of the house. A platter for each guest is laid out and the cooked leaves (*afei*) from the oven which form covers, for the food baskets, are spread over the platters as covers. The green leaves so often used on the trays for foreign visitors are an innovation introduced for them. The cooked *afei* leaves were the only form of leaf allowed by Samoan custom. When there are not enough platters, the less important chiefs are served on leaves alone. The food is then distributed on the platters. In an important meal with guests present, a talking chief personally superintends. Breadfruit and *talo,* which form the basis of the meal, are distributed on the basis of one or two whole *talo* and a breadfruit to each platter. The fowl, pork, packages of fish, and *palu sami* follow. The young men quickly place a platter before each guest, commencing with those of highest rank. The pork in ceremonial distribution may be delayed and follows after. One attendant may place the platters and others follow in quick succession bearing shares of flesh foods which are added to the platters before the guests.

As a beverage, drinking nuts are distributed to each guest. If anyone desires a drink of water, he calls to an attendant and a coconut shell cup of water is brought to him. The fingers of both hands are used in eating, but for the soft cooked *talo* leaves in *palu sami,* a piece of green coconut leaflet midrib (*su'i*) is provided by the attendants. The *su'i* is used as a fork to convey the *palu sami* to the mouth. To eat *palu sami* with the fingers direct is not regarded as correct.

During a day meal, girls or young men fan the principal guests and incidentally keep the flies off the food. Guests of honor are particularly waited on by the taupou. The service during the meal is very good. The attendants watch the guests and are ready to anticipate every wish. At a feast, the portions of food are far in excess of what can be eaten in one meal. It is the person's just share with the appropriate portions of flesh food due to his rank. A member of his family sits behind him under the eaves with a basket. When he finishes his meal, he passes the remaining food back and it is taken home. A member of the family with whom I was staying performed this duty for me. Any choice bits were served up again later, but the rest were the natural share of the family. In an ordinary meal, the platter is pushed away by the guest and speedily removed by an attendant. There is no ceremony of waiting till the others have finished. A bowl of water is brought for washing the hands. In these days, it is accompanied by a towel.

The girls and young men who attend on the guests, never eat until the guests have finished and the food is cleared up. They may then eat at the back of the guest house or retire to the dwelling house at the back.

Food is nearly always served with the guests sitting before the various wall posts. Occasionally in a family gathering, a long setting is made by laying green banana leaves on the floor and placing the food on them. Then men and women sit down together, but the seating places are always indicated by a talking chief or one who acts in that capacity.

FOOD CUSTOMS

Food customs are very important in Samoa and the ceremonial associated with them is still observed. All those to be described were seen several times, and play an important part in the social organization of the people. The chiefs are fed on the best food available. In ancient times, high chiefs who were regarded as kings, such as Malietoa, made a constant levy for food on the districts over which they had power. Bearers were constantly busy and even canoes from distant districts brought their tributes of food to swell the larder of their overlords.

A chief's food is termed *sua,* and the chief's word for ordinary food is *suavai.* It was cooked in leaves and brought in separate baskets to that for the lesser people. What is left over from the chief's meal may not be eaten by his own family. It is *sa* (prohibited) to them. It goes to his talking chief or to attendants not belonging to the chief's blood family.

Another individual custom is that of calling a chief's kava cup. During the ceremonial drinking of kava before a meal, a lesser chief could call out that he desired to follow a certain chief's cup (*ipu*). He received a cup of kava out of his turn. When the meal was served, the chief mentioned had to give his portion of food to the person who called his name. On Tutuila, the food part was not observed, but in Manua it was in force. Though the chief usually eats what he wants and passes the substantial remainder, strictly speaking, he should not eat any. He has to be satisfied with the honor. It occurred to me at Fitiuta, but fortunately I was not hungry, and was able to obey the strict demands of custom without personal inconvenience.

The sua ta'i is the ceremonial meal brought in to a high chief to honor him (*fa'aaloalo*). Four bearers bring in a drinking nut, *talo taisi,* a fowl, and a roasted pig in that order. The bearer of the drinking nut has a piece of bark cloth *siapo* girded round his waist. The chief sits cross-legged before his proper wall post. The bearer as he nears him, sits down on the floor before and sideways towards him. He then passes the drinking nut sideways to the floor before the chief. He removes the *siapo* and hands that over also. The others follow in succession bearing the food on platters which are laid before the chief from the sideways sitting position. The whole meal is called

a *sua* and a *sua ta'i* from the way in which it is presented. The drinking nut is also a *sua*: it is punctured through the *mata* hole and a bent piece of green coconut leaflet midrib may be placed in the hole as a temporary stopper. The nut must be opened only in this manner. To crack the *muli* end as for ordinary drinking would be taken as an insult and lead to reprisals. The nut is drunk by the chief's officiating talking chief. Owing to the small hole, the fluid is drunk with sucking noises which are regarded as appropriate. The empty shell is then broken on the stone *paepae* of the house. This again is of high significance. In ancient days, coconuts were only broken for the gods and hence today are only broken for chiefs of the highest rank. The *siapo* goes to the talking chief, who now takes charge of the food. The leg of the fowl with the coccyx (*le vae ma le muli*), and the loins (*tuala*) of the pig go to the high chief with some of the *talo taisi*. The rest is divided up by the talking chief as he sees fit. The high chief has no jurisdiction. The pig thus presented is called a *pua'a fata* no matter what the size. The term *pua'a fata* is usually applied to a very large pig which is carried in by several bearers on a litter (*fata*). The talking chief puts the *siapo* round him, goes outside to *ailao*. The *ailao* is the custom of calling loudly to attract attention while he calls the name of the chief who gave the *sua*. He thus calls public attention to the fact that his own chief has been honored, and at the same time acknowledges his thanks to the chief who paid the respect.

If the chief is of outstanding rank, he alone is served on a platter. The others are served on leaves. If there are other chiefs of high rank, each may get a *sua*. Several *sua* may be brought to the one chief by various high chiefs in the village. After the visiting chiefs has received his one meal, his talking chief may do what he likes with the other *sua*. If he has relatives in the village, he may send them presents of pork.

The *sua ta'i* ceremony takes place after the ceremonial drinking of kava. It awaits the directions of the officiating talking chief. During the Bishop Museum expedition to Tutuila, Mr. Judd received the chief's name of Laloifi. At Nua, after we had received the welcoming bowl of kava, the local talking chief called, "Au maia le sua a Laloifi" (Bring in the *sua* of Laloifi).

On lesser occasions when pigs are scarce, the *sua* may consist of the drinking nut, *talo*, yam, and a fowl. The yam is cooked in leaves like the *talo taisi*.

The si'u laulau is a small meal given to visitors immediately after their arrival in a village. The local chiefs visit the guest house and bring kava root with them. This kava is for the *ingunga* (welcoming bowl). The *si'u laulau* is just enough food to provide a *laulau* platter for each to form a light repast. Now it usually consists of tea and sugar. The ceremonial meal follows later when the ovens are ready.

The taunga is the very sensible custom of taking provisions when visiting another chief in the same village. The real meaning of the word *taunga* is surplus cooked food. When the cooking oven is opened, all the cooked food is placed in a basket or baskets. From them is taken what is needed for the ordinary regular meals. What is left over is used as a *taunga* and enables evening calls to be made for a number of purposes as follows:

1. Taunga i ma'i—to visit the sick (*ma'i*).
2. Taunga i alaalafanga—for a general meeting in the evening.
3. Taunga au moe—for visiting a young woman to whom respect or attention is to be shown.
4. Taunga i le aualuma—to the *aualuma* (unmarried women and girls in a village) who assemble at night in their own guest house, where those wishing to enjoy their society for singing and dancing take contributions of food.
5. Taunga i le foma'i, faifeau—for visiting individuals such as the doctor (*foma'i*), pastor (*faifeau*).
6. Taunga o le fale—for a special visit to builders who are constructing a house in the village.

From the above it will be observed what an important role food plays in the ordinary social life of the community. Food forms the basis of social intercourse. Hospitality is more than a virtue. It is a necessity. The *taunga* custom sought to relieve the burden of the host. The self-inflicted guest was sure of a welcome as he caused no embarrassment to his host.

The laulautasi is a presentation of cooked food to visitors by the chiefs (*matai*) of the village. The *sua ta'i* with pigs baked whole are given by high chiefs whose position or wealth enables them to give it. The *laulautasi* is a contribution in which all the lesser chiefs share. The matter of individual contribution is arranged beforehand by the village talking chief who makes a levy of three to five *talo* on each chief together with the appropriate accompaniment of a fowl, fish, or even tinned beef or salmon. Each chief sends his basket of food to the back of the house while he takes up a position within.

The baskets are collected in the back part of the house where the village talking chief presides over them. Each basket is handed to him in turn, and the name of the contributor is given. The talking chief calls the name saying "This is the basket of food of ——. It contains five *talo* and a bird." As he calls the articles he lifts them up, drops them back again, and lays the basket to one side. Each basket is called, together with the articles contained, such as packages of fish or squid (*afi*). Some receiving chiefs make a running commentary on the food; as, "Five large *talo* in good condition. One bird very fat." The remarks are sometimes humorous; as, "A package of fish. If more fish were put in, the package would not feel so slack. One bird, the

bird from America which calls in the early morning to wake us up." The bearer of the basket tells the caller what is in the packages; as, *palu sami, fai'ai, fish,* and squid. The ceremonial name of a fowl is here *ta'a paepae* or *manu tele*. At one village the receiving talking chief held up three *talo* and said, "These are *sungalo*." The *sungalo* is an inferior *talo* from a cultivation overgrown with weeds. The senior village talking chief who sat in his official place asked for them to be passed over to him. He examined them, gave a grunt of disgust and laid them aside. The donor had not anticipated that the contents of the baskets would be scrutinized. He was dealt with afterwards and fined for attempting to evade the true spirit of the custom.

The visiting talking chief acknowledges the gifts of food in a speech. He then proceeds to divide up the food into two portions, one for the visitors and the other for the villagers. The packages of fish and *palu sami* are usually taken out of the baskets and placed with the fowls to enable him to divide more easily. The general distribution being made, the village talking chief again gets busy and makes the individual distributions on plaited platters which the attendants quickly place before guests and hosts. All eat together. The individual division of food is called *tufaanga*. A larger portion given to any privileged person is a *tunga*. Any person with some extra portion may pass or send some of it to another. It is an act of courtesy which is never refused by the recipient.

The ta'alolo is a presentation of food to visitors given by the village, and is of a more public character than the *laulautasi*. Visitors of distinction, after the introductory bowl of kava, are given a *ta'alolo*. For the evening meal the presentation of food takes the form of the *laulautasi*.

The food which includes roasted pigs is carried in a public procession and deposited in a heap on the house platform. The procession is headed by the taupou in full regalia, accompanied by buffoons, who by their antics, direct attention to her. The food is then handed over by the village talking chief with a speech. In the speech, he addresses the visiting chiefs by their ceremonial titles and names of the districts they came from, indicating that the food offering is a token of respect paid to them by the village, and enumerating the articles of food.

A chief representing the visitors steps out on the house platform beside the food. He is sometimes accompanied by others to show greater respect. With the lower end of his *to'oto'o* staff placed between the first and second toes of his right foot, he draws the attention of his own party to the food offering. The formula used is a variation of the following: "Silasila ia lau susunga a Laloifi, ma Falesau ma Faleomavaenga, Tuitele ma oe le matua ma lenei malanga i le fa'aoloalo" (Behold O presence of Laloifi and Falesau and Faleomavaenga, Tuitele and you the father and this company of travellers,

the respect paid you). The "father" is the honorific title of high talking chiefs in Tutuila. He then enumerates all the different kinds of food that have been brought, his neighbors reminding him of any he omitted. The public acknowledgment and thanks being duly rendered, the food is divided up and the visitors and local chiefs have their meal. The attendants, and those whose status does not admit them to a place in the guest house, eat their share afterwards.

In connection with *ta'alolo,* it was usual to serve some special dainty such as *fa'ausi* or *taufolo*. They were always brought in separately from the other food.

The *fa'ausi* of baked, grated *talo* in the oily *niu tolo* preparation of coconut is always brought to the house platform in a wooden bowl. Young men garlanded with leaves bring the bowl from the cook house with *ailao* yells of "Mua o", to herald their approach. This announces to the visitors and the village that special attention is being paid to the guests. Green leaves of the *maopo* breadfruit are used to hold the individual portions. The bowl bearer sets the bowl down on the house platform, an assistant cups a leaf in his hands, and the portion of *fa'ausi* cubes with a share of oil is ladled into it with a half coconut shell. In placing the portion before the guest, a hollow is usually made for the leaf platter by scraping away a few stones from the gravel floor in front of him. For high chiefs, the leaf is first placed on a *mailo* platter of coconut leaflets before the portion is served. In olden times, a *mailo* platter was used for high chiefs alone. The lesser chiefs were served on the bare leaf. Now everyone gets a *mailo* platter.

The *taufolo* preparation of pounded breadfruit is brought in the same way by garlanded attendants making the *ailao* yells. The already pounded breadfruit mass in a bowl is placed on the house platform. The bowl bearer sits before it while attendants pour in the coconut cream to which salt water has been added. The operator proceeds quickly to pinch off the pounded mass into smaller pieces which are rolled or pressed into rounded lumps. The portions are placed on *maopo* leaves with some of the cream and conveyed by attendants to the guests. Banana leaf may be used instead of *maopo*. The usual hollows are made on the floor if necessary. The *taufolo* is served to all alike on the bare leaves, and no *mailo* platters were used ceremonially in the past, though they may be used incorrectly now. While greatly appreciated, *taufolo* has not got quite the status of *fa'ausi*. For one thing there was no oil which the system required and had few opportunities of obtaining.

Talinga. Similar to the preceding *ta'alolo* ceremony is the women's *ta'alolo,* or *talinga*. This ceremony has gained ground and became separated from the men's ceremony owing to the organization of women's committees in the various villages. In those given to us at the Tutuila villages, the event took place in the afternoon some time after the official receptions were over.

The women, arrayed in bark cloth and fine mats, assembled at some little distance from the guest house and then marched in mass. Each had some present of *siapo,* shell necklaces, or food. The food usually consisted of fruit such as bananas, papaia, and drinking coconuts. Sometimes fowls were brought. In front was the village maid arrayed in fine mat, dancing skirt of special make and the *tuinga* headdress of bleached hair. She carried a weapon, now usually the modern steel *nifo 'oti.* She advanced at a slow trot, every now and again making a curious little side step as if changing step and bending the body sideways towards the visitors. With the club, she made appropriate gestures. Associated with her, were one or two old women who by wild grotesque antics drew attention to her. They were dressed in an unusual manner to attract attention, and armed with sticks, ran about hitting trees, striking the ground, and pointing to the taupou. Their efforts were accepted as a matter of course and regarded as of a humorous nature. The village maid came right down to the guest house, paraded in front of it, and trotted back. During the whole time, the main body kept up a chant and beat time with their hands. Owing to the deliberate and slow approach of the main body, the taupou was enabled to make two or three excursions before the women got close to the house.

The women came forward, laid their offerings on the house platform, and retired a few paces. One of their leaders then made a speech welcoming the visitors in the usual ceremonial fashion. A visiting chief replied, thanking them for their tokens of respect (*fa'aaloalo*). Another chief replied also with a running commentary on the presents as he picked them up and bundled them into baskets. On these occasions, it was usual to let the younger or lesser chiefs reply on behalf of the party.

The women meanwhile had arranged themselves in rows usually on floor mats which were brought forward. They then performed a *siva* action dance in unison and in perfect time. Time was beaten on folded mats with two sticks and the bent knees in the cross-legged position kept time to the beat. The motions were made with the hands, head, and upper part of the body. Now and again the whole lines changed position on the mats so that they all faced to the side or back. In some movements, they rose to their feet and after some action subsided to the ground again. The taupou occupied the middle position in the front row. The old women remained standing, and by exaggerated gestures continued their humorous role.

After the massed *siva,* individual posture dancing in time to the beating on the mat was indulged in by two or three relays. An individual dance by the taupou usually concluded the performance.

The talo pa'ia is a form *of ta'alolo,* in which a whole district takes part in presenting food. In olden times, they were difficult to arrange owing to quarrels that arose between villages through questions of precedence. Nowadays, they are sometimes arranged for government officials.

Districts where precedence has been sharply defined and maintained do, on occasion, give a *talo pa'ia.* Such occur in the southern district of Savaii, where the village of Safotu-lefai has the acknowledged *pule* (rule). In Safotu-lefai there is a hereditary heraldic title of Tangaloa-tea. Four chiefs who have *tulafale ali'i* positions, combining high rank (*ali'i*) and the powers of talking chiefs (*tulafale*), exercise the *pule* over the district. They meet and decide as to whether the ceremony shall be performed for a specific occasion. They then call a meeting of chiefs and orators, who ratify the decision. The herald is sent to the different divisions of the district to notify them and to announce the number of *tuinga* expected from each division. The *tuinga* is the headdress worn by the village maids and chiefs' sons. Only certain chiefs' families

are allowed the right of wearing the *tuinga*. In some villages, there may be more than one family so entitled.

The divisions or villages proceed to make preparation. The *talo* is always the basis, but arrangements have to be made about the meat, *mea*, *ina'i* or *'i'i*, to go with it. The village talking chief rules that there must be *talo 'u'u*, that all must contribute *talo*. He rules *'i'i le pua'a* (the meat must be pork). He allocates the providing of a pig to certain sections within the village. The matai (lesser chiefs) of that section decide whose turn it is to contribute the pig. They take turns to supply the various calls made. The term *'i'i le pua'a* literally means to make the pig squeal.

The official herald goes through the village proclaiming, "Sao le ta'alolo" (Collect the food for the *ta'alolo*). The food is gathered together and the shell trumpets sound "Tatou tu'u" (Let us go). When the collecting village of Safotu-lefai is neared, the food bearers form up in line with all the wearers of *tuinga* headdresses in front. The *tuinga* are thus in line in the advance to the collecting place for depositing the food. They are all equal and no trouble occurs. If they advanced in column of sections with a *tuinga* heading each section, there would be trouble as to which *tuinga* should lead the first section.

The open line advances on the assembly house, each person carrying some food, the wearers of the *tuinga* in front, going through appropriate actions as in the women's *ta'alolo*. The main body as they advance, indulge in the songs and dances which have been previously rehearsed.

The food is placed before the assembly house and the bearers retire to the sides or to a neighboring house. The official talking chief of the party makes a speech in the open termed *fa'afiti le mu'a*. No matter how large the contribution, he apologizes for the small supply brought.

The receiving talking chief steps out in front of the assembly house, and in ceremonial language thanks the visiting village for their contribution. The food is now termed *folafola le ta'alolo*. The talking chief of the *malanga* (visitors) now has *pule* (power) over the food of the *ta'alolo*. He distributes it in the usual way. Each share is here called a *tu'unga*.

THE STRANGER'S POST

An interesting custom exists with regard to the rights of a stranger to demand hospitality at a feast. A stranger who comes as a guest is, of course, provided for in the usual way. The stranger who is unheralded and unknown has the right to the stranger's post. Entering from the front, it is on the left in the guests' section (*tala*). Being careful to eliminate the wall posts of the middle section, he commences counting from the post nearest it. The fourth wall post is the stranger's post. If the stranger is of chief's rank, he takes the fourth post on the front, but if beneath that rank, he takes the corresponding fourth post at the back. No matter what chief is sitting before

it, the stranger can demand that he relinquish the position, for it is the stranger's post. The custom is ancient and must be complied with.

KAVA

Kava (*Piper methysticum*) is cultivated not only for ordinary use but as an essential element in social usage and ceremonial. It grows best in stony ground and is to be seen planted close to the houses where such conditions exist. Different varieties are recognized. The Samoan form of the kava name is *'ava*.

The Tutuilans maintain that the first kava was found at Fanga-fue on the north coast of Tutuila. Manuan legends are full of references to the use of kava in the Tangaloa period. Kava drinking occurs in the passages between Tangaloa-ui and Pava whence is derived the expression "Liunga lua le taeao" of which a free translation is, "The second bowl of kava is the better." One of the trials to which Le Lafonga, the younger brother of Tae-o-Tangaloa, was subjected was obtaining the *'ava va'ai* (wild kava), which joined together again immediately it was cut. The medical use of kava has been summarized by Churchill (7, pp. 57-58).

The plant was suitable for use after four or five years growth. The whole plant was dug up and the tops removed leaving part of the stems attached to the roots. The mass of roots was split up into convenient portions. Two internodes of stem were left attached to large pieces of root to form the *tungase* for presentation to visitors of rank. (See Plate VIII *A*, 1.) The stem part formed a handle for carrying the *tungase*. The earth was beaten off and the roots washed, scraped, and dried in the sun. Roots not suitable for *tungase* had the stems cut off, and were divided up into short lengths to form the *fasi 'ava* for ordinary use. The chiefs' name for this form was *'ava fele fo'e*. The long finer roots made the best kava and were not scraped. (See Plate VIII *A*, 3.) They were also used in the *'ava uso* ceremony (*uso*, brother). A chief had to have a stock of dried kava always on hand not only for his own use, but for the innumerable calls made upon him by ceremonial custom. Those below the rank of matai (head of a small family group) were exempt from such calls. On election to the rank of matai, one of the first things to be done was to lay in a stock of kava. Failure to comply with the customary presentation of kava led to loss of prestige and probably deposition from a position which the holder failed to maintain with dignity.

UTENSILS

The materials necessary for preparing the beverage also termed kava are the dried kava root and water. The utensils used in preparing and serving are the bowl, strainer, and cup. In former times, the root was broken up into small pieces and chewed, but now it is pulverized mechanically. Mortars and

pounders have thus been recently added to the list of utensils. A large leaf is used to convey the pounded root to the bowl.

KAVA BOWLS

Kava bowls (*tanoa 'ava*) may be divided into two main types, round, and elliptical. All are cut out of a solid section of the tree.

Round bowls are practically circular at the rim with an inverted dome-shaped body set on legs and furnished with a perforated lug by which to suspend the bowl. They range in size from the small bowls for family use to the very large bowls used on ceremonial occasions. The cavity (*liu*) is evenly concave and fairly shallow. The proportion of depth to diameter ranges in the examples figured (Pl. IX, *A* and *C*) from 26 to 30 per cent. This forms a marked contrast to two large but proportionally much shallower Fijian kava bowls in Bishop Museum which give a width-depth index of 19 and 20.

The rim in all bowls has a level upper surface formed by the horizontal space between the inner and outer surfaces of the bowls. When the inner and outer surfaces are approximately parallel near the rim, the rim surface is but slightly wider than the thickness of the wood below which is accounted for by the angle formed by the upper surface. The outer surface of the bowl is sometimes inclined outwards from its normal plane near the rim and may make the upper surface of the rim as much as 0.5 inches greater than the thickness of the wood below it. (See Plate IX, *A*.) Again, the outer surface may be trimmed inwards which makes the rim upper surface narrower than the wood thickness below it. (See Plate IX *C*.) The upward directed surface of the Samoan rim is emphasized because in the two Fijian bowls mentioned above, the cavity has a concavo-convex curve which directs the surface of the rim outwards. The Samoan rim surface is usually perfectly level and plain but two bowls in Bishop Museum show the outer part of the surface slightly raised and incised with parallel oblique lines which give a corded ornamental effect (Pl. IX *B*). The rim is rarely quite circular, cross diameters usually varying about 0.25 inch and in some bowls as much as 1 inch.

The legs, normally consisting of four, are attached to the sides of the bowl usually 1 to 2 inches below the rim but sometimes as close as 0.5 inches (Pl. IX, *B* and *C*). The attachment to the bowl is oval with the broad end internal and the long axis radiating from the center. The curve of the outer part of the attachment is blunter when the legs are rounder in cross section. The legs taper towards the lower ends where they are elliptical or round in cross section. The amount of taper varies, ranging from legs nearly cylindrical to those that almost appear pointed. In some legs, the outer line from the junction to the lower end instead of being straight may be concave giving the false appearance of a curved leg. The lower ends may not be cut level,

as only part of the surface rests on the ground. Individual legs on the same bowl may vary in attachment level and proportions showing that exact measurements were not used by the craftsmen.

The spacing between legs is not exact, no two pairs being the same distance apart. With the lug towards the observer, the legs are wider apart from side to side than antero-posteriorly. The length of the legs, measured on the inner side, range in the series figured from 3 to 4.25 inches and all give good clearance to the bottom of the bowl.

The suspension lug, a constant feature in all bowls, projects from the outer side of the bowl midway between a more widely spaced pair of legs and approximately on the same level as the leg attachments. Two forms prevail; the "V" shape and the "T" shape. The "V" shaped lug may be open or solid. In forming the "V" shaped lug a solid triangle with the apex towards the rim is left in position on the outer surface of the bowl when shaping it from the solid. The base of the solid triangle is subsequently cut out to define the two sides into the arms of the "V" when making the open form. The arms range up to 2 inches in length and from 0.5 to 1 inch in depth or outward projection from the bowl surface. The thickness is less at the outer ends and may reach 1 inch at the junction of the arms. The surfaces of the arms are sloped towards each other to form a sharp edge, or the edge may be rounded off. The free edge of the arms may be trimmed down towards the free outer ends, making them lower there than at the apex. The free ends may be left vertical or cut at a slant. A hole is bored transversely through each arm on either side of the apex and on the level of the surface of the bowl.

In the solid "V" form, the wood between the sides of the triangle is not removed. Of the three sides of the triangle, the base is vertical but the sides are sloped inwards towards each other. The plane of the external surface is altered by cutting at a slant from the apex towards the base so that the apex is deeper than the base. Two holes, one on either side of the apex, are bored through the solid triangle to emerge through the base surface. (See Plate *IX, C.*)

In the "T" shaped lug, a triangular piece of wood, with the base towards the rim, is left on the outer surface of the bowl in shaping from the solid. This is subsequently shaped into a raised "T" with the crossing limb formed by the base running parallel with the rim and the stem running radially towards the center. A hole is bored through the cross limb on either side of the stem junction.

One or more cords of sennit braid are passed through the holes and tied into a loop to which a thicker cord is tied, or longer cords are drawn through to their middle and plaited together into a thicker three-ply braid.

One type of Samoan bowl has many legs, rounded, or sometimes square, set close to the rim of the bowl. The extra number of legs was supposed to

distinguish Samoan kava bowls from those of Tonga and Fiji but is admitted by the Samoans themselves to be modern. (See Plate IX, *D*.) Such bowls are in common use but are particularly made for tourists who are charged so much a leg. The method of incised carving of the rim and inlaying with lime seems to have also been stimulated by the tourist traffic.

Elliptical bowls are small and only suitable for a few persons. The cavity at the rim is elliptical but the outer edge of the rim is prolonged into points at the ends to form an acute ellipse. The bowls have four legs and a suspensory lug. The outer surfaces from the sides meet in a mesial longitudinal edge which extends from end to end on the under surface. The legs are round but somewhat elliptical at their junction with the body due to the curve of the outer surface and are further away from the rim than in round bowls. The suspensory lugs, doubly perforated, are placed in the middle of one of the long sides, at a slightly higher level than the leg attachments. In the two bowls figured, one (Pl. X, *B*) forms a widely open "V," whilst the other (Pl. X, *A*) forms a roughly made straight projection parallel with the rim.

In Savaii, elliptical bowls with a flat bottom and without legs were in use in many families as kava bowls. They were of the same shape as the elliptical food bowls but were without handles at the ends.

Edge-Partington (10, vol. 1, p. 110) figures Fijian kava bowls of the elliptical form with pointed ends and four legs; also acute elliptical forms without legs.

Some of the large round bowls belonging to high chiefs were named and it was considered an honor to have the privilege of drinking kava prepared in them. Such a bowl belonged to the Tui Manua. Its manufacture was celebrated by the whole island of Tau. On the visit of the father of the present Tuitele of Tutuila with the chiefs of the Alatauan district to Tau, the bowl was used and a drinking competition developed. Bowl after bowl was prepared and finally, Nano of Tuitele's party, using a smaller kava bowl as a cup, won the competition. The bowl was then handed over to the victorious party, and remains in the possession of the Tuitele family.

KAVA DRINKING CUPS

The drinking cups (*ipu'ava*) are made of the *muli* end of the coconut cut transversely. The transverse direction is specified because the nut may be cut longitudinally or obliquely as was done by the Hawaiians. Through the projecting *muli*, a transverse hole is bored through which a loop of sennit braid is usually attached. The cups vary in size, not only from the size of the nut used, but from the segment cut off. Regarding the *mata* and *muli* ends as the poles, the smaller nuts are usually cut off on the *mata* side of the greatest circumference thus forming a small but deep cup. With large nuts, the division is made on the greatest circumference or even below it, thus form-

ing a wide but comparatively shallow cup. The cups are usually scraped smooth on the outer surface. In course of time, they become coated with a pale, bluish patina derived from constant dipping in the kava. This adds materially to their value. When no longer in active use the patina fades to a yellowish color, and may even flake off in parts. The inside of kava bowls also becomes coated with this patina, but as with the cups in Museum specimens, the color fades and the material flakes off.

In some kava cups the outer surface is not polished but left in the rough, natural state except for a depth of 1 to 1.5 inches from the circumference of the rim. Such a cup was that owned by the late Le Oso Ripley of Leone. It was named Tao-nei and was quite famous. It was never used at ordinary drinking at night, but only on ceremonial occasions. If a chief expressed a desire to use the cup, a pig had to be killed to provide the necessary accompaniment to appropriate ceremonial. This gave rise to the name of the cup, Tao-nei (cook now).

Some cups, from the polishing both inside and outside were very thin. An ordinary half shell from a drinking nut is used in the kava naming ceremony. (See Plate VIII *B*, 4.)

THE STRAINER

The strainer (*to tau 'ava*) and wringer is made of strips of *fau* bast and hence also called *fau tau 'ava* where *fau* refers to the material, whereas *to* denotes the actual article, and *tau*, to wring. A strip of *fau* bast to serve as a connecting cord is tied by one end to the big toe. Strips of *fau* ranging from 3 to 4 feet are doubled and the loop passed under the fixed strip, doubled over it, and the finger passed down through the opened-out loop to pick up the ends which are pulled up through the loop, and drawn taut. In this way, strips are attached close together along the fixed strip in exactly the same way as in making one form of bast kilt. When a number of strips have been so added for about a foot along the fixed strip, it is unfastened from the big toe and the two ends tied together. (See Plate VIII *C*, 1.) The process is called *fifi fau*.

To render the new strainer fit for use, the woody particles from a kava brew instead of being flicked off outside are collected on a mat. After the prepared kava is drunk, the woody refuse is put back in the kava bowl, mixed with water and the new strainer soaked in it. The damp strainer is then wrapped up in a green banana leaf or put into the kava cup and left there until needed. The process termed *fa'amata* takes the newness out of the strainer and prevents it from tainting the taste of the kava. Even with a used strainer, the kava is better if the strainer, instead of being hung up to dry, is put damp into the cup and left there until needed. In the course of time the used strainer gets a tangled appearance. (See Plate VIII *C*, 2.)

STONE ANVILS AND BEATERS

The dried kava root in olden days was easily broken into smaller pieces by beating with a stone on one of the larger stones of the house platform. The pieces were distributed among young women with good teeth and chewed. The chewed material was placed on leaves, and when a sufficient quantity had been so treated, it was collected and placed in the bowl. Young men or boys were also requisitioned for this purpose. The method of chewing prevailed until quite recently. There are many men living, slightly past middle age, who chewed the kava root in their youth.

Chewing was abandoned as a result of European culture influence, and the root is now always pounded on a stone with a smaller one. There are thus no special stone implements belonging to ancient Samoan culture that were used in the preparation of kava. Since pounding on stone commenced, every household has selected some stone to serve as an anvil. Some are flat stones incorporated at the edge or corner of a terrace in the house platform. The most suitable of all, however, are large portable stones that were originally used for grinding stone adzes. The hollows formed by the grinding of the past furnishes a convenient receptacle for the small pieces of kava root. (See Plate VIII *A*, 5.) Here they are pounded with any rounded, waterworn stone of suitable size and weight and the powdered material is thus prevented from falling over the edges onto the ground. Such stones have been transported from the edges of streams where they were formerly used because of their nearness to water, which was essential to the grinding process (*olo*). Some of them simply lie on the house platform or have been fixed on the edge of one of the courses, while others lie loose at the back of the guest houses. Many foreigners, and even Samoans, think that the hollows have been formed by pounding the kava root, but though in many the hollows have been roughened and chipped by pounding, careful scrutiny will in most cases reveal parts of the smooth surface originally produced by grinding. Such stones have become regular anvils for pounding kava but the original use which produced the hollow concavities must not be overlooked. They are now in use throughout Samoa.

The stone pounder now used is as stated an ordinary waterworn stone which is kept beside the stone anvil for use in connection with it. A few seem to have been slightly chipped to afford a better grip, but this is unusual. There are no worked stone pounders for this special purpose as any incentive that might have led to their production is of recent occurrence. It has been shown that no such incentive existed in regard to the preparation of foods. Judging from the rough types of the adzes, the attitude of the Samoan toward working stone seems to have been a conservative one. So long as the stone served its immediate purpose, why go to further trouble for aesthetic reasons? The small stone in Plate VIII, *A*, 4 has been actually chipped out to form a

small mortar for pounding a sufficient quantity for one person. It is a freak probably like the person who used it.

The kava root was always pounded outside where the anvil had been located. The pounded material was scooped out of the anvil hollow into a section of banana leaf or a breadfruit leaf, brought in at the back of the house, and handed to the taupou or whoever presided over the kava bowl. The pounding was done by one of the young men connected with the household to whom the chief threw out a piece of root, calling out, "Tu'i le 'ava (pound the kava)."

PREPARATION OF THE BEVERAGE

On important ceremonial occasions, the taupou makes the kava as part of her official duties. For lesser occasions an unmarried girl of the family presides over the bowl, and for ordinary drinking, a young man, irrespective of rank, may perform the duty.

A mat is spread at the back of the middle section of the house. The taupou seats herself often with a female companion on either hand. The one on the right attends to the water. The bowl with the strainer and the coconut shell cup are placed before the taupou. The attendant on the right takes the cup. The taupou always turns the bowl around until the suspensory lug with the hanging string is towards her. She dusts out the bowl with the strainer. The kava root which has been pounded outside is brought wrapped up in a leaf and handed to the taupou who pours it into the bowl. The taupou turns to the right rear, holds out her cupped hands to the girl on her right who pours some water into them. The maid never omits to wash her hands in this fashion. The attendant then pours some water into the bowl. Formerly this was done from a coconut water bottle, now it is dipped from a bucket with the cup. The maid proceeds to work the material with both hands to promote the dissolving and mixing of the powdery part of the pounded root. The *fau* strainer is spread out along the near circumference of the bowl and allowed to become soaked. It is then pushed down along the bottom and the sides to scoop up the undissolved material. At the far side of the bowl, the ends are brought in to overlap and enclose what has been caught up. The scooping movement is called *ao*. The strainer is brought up out of the fluid on the palms of both hands directed upwards. It is doubled over and twisted with both hands to wring out (*tatau*) the fluid. All the fluid being expressed, the maid glances back and throws the folded strainer with precision between the wall posts to an attendant waiting outside on the house platform. The young man catches it in the air, opens it out and by successive flickings gets rid of the pieces of wood. The strainer is tossed back, caught before it can touch the floor and the maid continues the *ao* process. A good deal of style is imparted to the wringing by tossing up the folded strainer to reverse its

position and by swings of the elbows and graceful movements of the forearms. When all the larger pieces are removed, the *ao* movements are changed to *fa'apulou* (*fa'a,* like; *pulou,* head covering). In *fa'apulou,* the opened-out strainer is dropped on the surface and pressed down to the bottom to pick up the powdery parts that remain undissolved. The outside attendant is no longer needed as the maid after wringing the strainer turns her body to the right rear, opens out the strainer and flicks it herself from where she is seated. She also imparts style to her movements in wiping the sides and upper edges of the bowl with quick upward sweeping turns at the end of each movement. She also wipes any pieces adhering to her hands before she flicks the strainer. The chief who supervises the distribution of the kava, if the speeches are over, may shorten the period of the *ao* movements by ordering the maid to go on with the *fa'apulou* by calling, "Fa'apulou le 'ava."

All the undissolved material having been strained off, the maid drops the strainer into the bowl and lifting it high allows the fluid to stream down. From the color, the strength is judged. It is stated that the experts judge by the sound of the falling liquid. If too strong, more water is added.

SERVING

An attendant now comes forward with the kava cup and stooping down holds it over the bowl. The maid lifts up the saturated strainer above the cup and allows the kava to stream into it until it is about half full. The attendant must always be stripped to the waist in formal kava drinking. He straightens himself up, and holding the cup about shoulder high, awaits directions. The chief who distributes (*fa'asoasoa*) then calls (*tapa*) the name of the chief to whom the cup is to be served. If the attendant hesitates, it is usual for the chief named to clap his hands, slap his thigh, or say something to indicate his position to the cupbearer. The cupbearer should always take the longest way around to the chief whom he serves. Thus, if the chief named is on the left side of the house, the bearer walks around the right side of the central supporting posts of the ridge and then towards the chief, to approach by a short cut from the same side of the supporting posts is poor form and shows that the cupbearer has not been properly brought up. As the cupbearer approaches the chief, he raises the cup head high. The manner of presenting the cup depends on the rank of the chief. To any but a talking chief, he stoops and bringing down the cup with a sweep from the right as low to the ground as possible, he presents it with the palm of his hand towards the chief. To a talking chief he turns slightly to the left and brings down the cup with a backhand sweep from the left so that the cup is presented with the back of his hand still towards the chief. The distinction between forehand and backhand is important. When the chief takes the cup the bearer steps backwards two or three paces and stands still at attention whilst the chief drinks. He then

steps forward, receives the cup and returns to the bowl for the next helping. A well instructed cupbearer adds materially to the dignity of the ceremony.

Receiving the cup. Proper etiquette must be observed in receiving the cup. A chief, other than a talking chief, takes the cup by hooking his forefinger over the rim. A talking chief receives the cup in the open palm without hooking his finger over the rim. If his neighbor is a high chief, he holds out the hand on the side away from him. If there is a high chief on either side of him, he compromises by taking the cup in both hands.

Drinking. On receiving the cup, a few drops are poured out on the floor before drinking. This is termed *sa'asa'a* and is usually held to be a libation to the household gods. It is sometimes said to be a way of deflecting mischievous spirits while the guest drinks in peace. The people of Manua connect it with a historical incident between the ancestors Tangaloa-ui and Pava.

Tangaloa-ui while drinking kava with Pava near Saua on the island of Tau killed Pava's small son owing to the noise and disturbance he created during the ceremony. To the angry parent, Tangaloa said, "Liunga lua le taeao," interpreted as meaning, "There will be another bowl of kava later," or, "The second bowl of kava is the better." The two passed on to Namo, taking the corpse with them, to a house beside the stream which was flooded. There Pava went out, tied some *talo* leaves around his head and floated down past the house. Tangaloa, however, not deceived by the floating *talo* leaves called Pava into the house. By this time the kava was ready. Tangaloa again said, "Liunga lua le taeao." When the cup was passed to him, he asked Pava for a *talo* leaf from his headdress. Taking the leaf and tearing it in two, he poured some of the kava from his cup upon it. Turning to Pava he said "Just as water will not soak into a *talo* leaf, so death has not penetrated the body of your son." The boy quivered and sat up. Thus for Pava, the second brewing of kava was the better.

In memory of that event, say the Manuans, a little kava is always poured out on the floor ere drinking and the tip of the *talo* leaf is pinched off before cooking. The usage has been rationalized by the Christian community who as they pour out the kava repeat some formula, such as, "May God bless this gathering."

The mats are usually separated so that the drops may be poured on the gravel floor, or the guest may turn slightly and pour the libation out on the bare gravel near the wall posts. Some pour a few drops on the mat in front of them and others merely go through the motion of tilting up the cup without actually spilling any kava. The small quantity poured out is termed *sa'asa'a*. The guest then raises the cup to his lips with the salutation of "manuia." Some continue the invocation into a salutation to those present, especially the guests. The salutation takes some such form as "Ia manuia le afionga o Langi Filoa ma le faletua. A 'ia manuia lo latou fa'atasianga" (Good fortune attend the presence of Te Rangi Hiroa and his wife. Good fortune also attend our being united together)."

Some Samoans do not care for kava. They either call out their thanks and refusal when their names are called, or accept the bowl and, after raising it with a salutation, return it untouched to the cupbearer. The bearer on returning pours it back into the bowl and gets a refill for the next call. Others retain the kava in the mouth, hand back the cup and after gargling the mouth reject the fluid between the wall posts to the platform outside. This was often done, and is no breach of manners either in sound or procedure. The cup generally contains a little sediment at the bottom. After drinking, the dregs are tossed out to the back (*sasa'a*). The cup is always handed back to the bearer and not tossed back as in Tonga. Anyone requiring a good drink may, on seeing that the cup is only partly full, send it back to be filled without breach of etiquette.

Seating. The position of guests and hosts within the guest house during the formal drinking of kava is the same as at a feast. The kava is always introductory to other activities. The position of the person preparing the kava and the assistants has been described. The remaining special position is that of the person who presides over the distributing of the kava. On ordinary occasions he usually sits on the right, next to the attendant with the water. When specially appointed, he may be on the left near the bowl.

Distribution (*fa'asoasoa*). On ordinary occasions, one of the lesser talking chiefs of the family group, sits down beside the bowl as a matter of course. Where guests or others are present, the talking chief on the front side (*luma*) of the house may call out to a particular person, "Alu fa'asoasoa le alofi" (Go and distribute the kava). *Alofi* is the honorific title of the prepared kava. On ceremonial occasions a special appointment is made from the higher talking chiefs. The appointment is really one of the perquisites of the talking chief's office. If appointed by the village high chief, the village chief usually rewards him with a piece of barkcloth. The appointment, however, is usually delegated to the visiting high chief. The village talking chief asks who is to distribute the *alofi*. The selection is made by the male visitors from the local talking chiefs. During the Bishop Museum malanga in Tutuila, Mr. Judd, the leader of the expedition, was always asked whom he would appoint, though he did not know the names of the local talking chiefs. He in turn deputed the selection to the official Samoan talking chief who acted in that capacity to the expedition. The chief so appointed was called the *aenga o le alofi,* or the *taulangi.*

The distributor, besides calling the names of those present in correct order, has a certain formula to call as the making of the kava nears completion. After taking up his position and watching the steps of the preparation, he calls in a loud recitative tone the following announcement or some variant of it.

'O le angatonu o le taeao,	The kava of the day,
'O le fesilafa'inga matangofie,	The pleasant meeting together,
'O le susunga mai o le susunga o Laloifi.	Of the coming of the presence of Laloifi.
Ua matou lingina iai le vai malu.	We have poured cool water (into the bowl).
A usi, ua fa'asoasoa.	When it is strained, it will be distributed.

As it is nearly strained at this point, he commences to clap his hands together (*tapati*) and all those present in the house follow suit.

The first cup is then called and so on in ceremonial order of precedence. The most important cups are the first and the last. The distributor watches the bowl to see how far it will go. If there is not enough kava to go round a large assembly, he leaves some of the lesser chiefs out. He takes care to call the last cup before the bowl is empty. He is then sure of getting a drink himself if he has not called his own name. If there is plenty of kava to go round, the remains after the last cup called may be drunk without announcement by the lesser chiefs seated near the bowl. The call with the last cup is an announcement that the bowl is empty. There are many variants of the following call.

Ua motu le alofi	The kava is finished
Ua mativa le fau	The strainer is dry
Pa'upa'u tafa'i mamao.	The chiefs from afar have emptied the bowl
Fa'atasi e Falesau ona toe.	The dregs will be drained by Falesau.

The last official cup is then taken to the chief named. The visiting chief then gives the distributor a present of a piece of bark cloth. Money may now take its place; half a dollar being the equivalent of a piece of bark cloth. The coin is tossed over with the words, "Here is your *siapo* (bark cloth)." The distributor touches his head with the coin or the cloth as a mark of respect. He then goes out on the house platform and calls the names of the visiting chiefs, finishing up with *fa'afetai* (thanks): "Laloifi e! Falesau e! Falemavaenga e! Ie'ei! Fa'afetai!"

Order of serving. The order of serving the cup is definite. The senior visiting chief gets the first cup and the local chief the next. Then it alternates between the two parties according to the order of precedence on each side. Next to the first two chiefs are the senior talking chiefs of the visitors and then the senior talking chief of the village. On our expedition some of the local high chiefs to pay us a special compliment had our three cups served first before allowing their own names to be called. One talking chief at

Fangasa, for the sake of effect, threw in a tin can for his portion as he was not worthy to drink from the same cup. Sometimes, where government officials are welcomed, a dilemma occurs occasionally through a young Samoan clerk holding a matai title. Hence, as the cup alternates between the two parties, the Samoan clerk may appear higher up in the Samoan list than his master does in the Government official list. The latter then has the chagrin of seeing a junior clerk from his own office receiving a cup several turns before it comes to him. He seldom realizes that his employee enjoys a higher social position among his people than the master in his own society. The last cup as already indicated goes to a chief of high rank. This is often convenient for the distributor when puzzled as to precedence between two high chiefs; he gives one the first, and the other the last.

A lesser talking chief who would come well down the list may get a turn before it is due by calling the name of a high chief or visitor, saying, "O le ipu o Laloifi o lea 'ou alu ai" (The cup of Laloifi is that which I follow). He is served with the next cup without the distributor calling his name. If the distributor has a sense of humor, he sees that the cup is filled to the brim. If the recipient cannot empty it, he feels rather ashamed as humorous remarks are sure to be made about him. In Manua, the man who calls a chief's cup also gets his portion of food when it is served later.

Prompting. The distributor knows the order of precedence of the local chiefs but he may not be sure of that of the visitors. Many chiefs have kava cup titles which must be called officially. To avoid error, recourse to prompting (*taulalo*) is necessary. The visiting talking chief sees to it that the chiefs of his own party are fittingly announced by telling off one of the lesser chiefs to act as prompter to the distributor. He calls out, "Sau se isi e taulalo i le alofi" (Come some one to prompt the kava). On our malanga, the young chief, Samonga of Leone, always took his place near the bowl to *taulalo i le alofi*. He told the distributors our newly-conferred cup titles to enable them to make the correct calls.

KAVA CUP TITLES

In olden times in Manua the use of the term *ipu* was confined to the Tui Manua, the highest chief of the Manua group. In calling the kava of the Tui Manua, the distributor called, "Au maia le ipu o Tui Manua" (Bring the cup of the Tui Manua). For all other chiefs the kava was *taumafa* (food) and the call was "Aumaia le taumafa a................" (Bring the food of................). In the other islands of Samoa this monopoly of the term *ipu* did not exist. Prominent chiefs, however, had a special title that was called at kava drinking in place of their personal names. Where such titles had been conferred or inherited, to call the personal name or chief's title was a serious breach

of etiquette. The personal title was preceded by the introductory words "Aumaia le ipu" (Bring the cup).

Some titles include a preliminary phrase before the actual call for the cup. The phrases sound well and have interesting meanings as shown by the following examples.

Tala i malo tu. Speak of unshaken authority.

Fa'avae mai le vavau. The foundation, firm from ancient days.

Toto'a mai le vavau. The threshold from olden times.

Ainga ua soso'o. The family united.

The first preliminary phrase, "Tala i malo tu, aumaia le ipu a Laloifi," was used in the cup title given to Mr. Judd (Laloifi); the second phrase, "Fa'avae mai le vavau, aumaia le ipu a Falesau," was used in that of Mr. Cartwright (Falesau). Because of the introductory phrase, the proper names are mentioned with the cup.

Another variant consists in using two phrases and dropping the proper name. At Aoloau, such a title was given to Mr. Judd: "Ainga ua soso'o aumaia malo ua maua," (the family is united, bring authority which is accepted). My first cup title of Malo-le-foua was charged at Vailoa to one of these double phrases: "Toto'a mai le vavau, aumaia fetaia'i ma uso" (The doorway to the past is open, bring the union of brothers). The name was given for reasons described under the *'ava uso* ceremony.

Various cup titles run in certain families which have the right to confer them on others. The cup titles given to the Bishop Museum party were conferred by the high chief Tuitele. Some of the chiefs in villages outside his district were inclined to doubt the advisability of conferring them on strangers without first calling a convocation of the Alataua district, but his right to confer them was never questioned. It was a transient, unsought honor, as far as the recipients were concerned, but of value in throwing light on Samoan custom and of interest also in indicating the opinion formed of Bishop Museum by Tuitele and his Councillors. The same titles are used in other parts. In Savaii I heard my Tutuilan cup name of Fetaiai-ma-uso called in two different villages.

KAVA NAMING CEREMONY

At Nua, Tutuila, the ceremony of officially calling our newly given kava cup titles was gone through with the old ceremonial which is now rarely seen. It thus merits a description.

When we were seated in the guest house yells were heard from the bush at the back. A man came out of the bush with a stick which he flourished as he capered about with exaggerated movements. He worked around to the front of the guest house calling in a wailing cadence, "Mua o—." A group of young men carried in a freshly dug-up kava plant which was cast on the front of the house platform. People bedecked with leafy garlands also filed in from the sides answering the soloist's calls with a similar call in unison. They also worked round to the front where they sat down cross-legged under

the trees in lines facing the house. A kava bowl was set down in front of the middle of the front row. A speech of welcome was made from the open space and a *tungase* sent up. Our senior Samoan talking chief took charge of it. Kava was prepared and more speeches made.

One of our own party entered the house and sat down cross-legged in front of us with his back towards us. Another of our attendants stood just outside the house. Both were young chiefs. The distributor of the kava sat outside near the bowl. The kava cup title of Laloifi was then called. The cupbearer brought the cup and handed it to the attendant outside. He entered the house bearing the cup and marched around to face the second seated attendant. The latter held a new cup made of the half of an ordinary drinking nut. It had to be new also in the sense of never having been used for the drinking of kava. Holding the cup of kava high, the first attendant poured the contents from this height into the cup held low by the seated attendant. It mattered not that some was spilt as long as a certain amount was caught in the lower vessel. The seated attendant, without turning, passed the cup behind his back to Laloifi. Laloifi took the cup with crooked forefinger, poured out a libation, raised it with the customary salutation, and drank. The seated attendant changed his position to the front of Falesau with his back towards him, while the first attendant went outside and handed his cup back to the cupbearer. Falesau's cup title was called and the same procedure gone through. A third time it was repeated for the cup title of Faleomavaenga. The people outside, led by the distributor Noa, clapped hands in unison, first high up and then low down in a number of alternating movements. So far as we were concerned, our cup titles had been officially confirmed by ancient ceremonial. Our two official Samoan talking chiefs were served in the ordinary way. The high chief Tuitele who accompanied us should have had a fresh bowl of kava made for him to accord with his rank, but he dispensed with that part of his privileges to shorten the ceremonial.

THE USUAL CEREMONY

The various phases of the kava drinking ceremony have been described. It is necessary, however, to describe the order of events to get an idea of its place in the social usages of the people.

Nothing of any importance can be commenced in Samoa without a preliminary bowl of kava. Visitors of any note must be welcomed not only with a bowl of kava but also with some pieces of the dried root. Thus when visitors enter a village, they are allowed a little time in which to rest and compose themselves after their journey. The local chiefs usually gather in a nearby house until they see that the visitors are ready. Each chief of any standing brings with him some dried kava, generally a *tungase,* or failing that, an ordinary piece without stem (*fasi 'ava*). Apart from the presentation aspect of the question, he owes it to his own social position to bring something. Otherwise he does not exist in the *fa'alupenga* (chiefly list of the village). By the time they enter the guest house, the visitors have assumed their correct positions besides the wall posts that mark their rank. The local chiefs may shake hands as they enter. They may drop their pieces of kava root in front of the visiting talking chief. There is no doubt as to who or where he is. He is sitting by the middle wall post of the front side of the middle section of the house. On the other hand they may take their kava root with them and pass directly to their own positions in the house. In strict ceremonial the

latter course is the correct procedure. As they sit down they mumble forth the stereotyped greeting of "Susu mai lau susunga, le susunga o................" (Welcome to your presence, the presenee of................). They go on with the formula demanded by the *fa'alupenga* of the village and district to which the visitors belong. To mark respect for the highest rank, *afio* is used instead of *susu*, and *afionga* for *susunga*. Each chief repeats it, often in a singsong voice. The visitors then reply in the form demanded by the local *fa'alupenga*. The senior village talking chief has the kava root eontributions passed along to him. He collects them in front of him and then makes a short speech enumerating the number of *tungase* and other pieces that the village has contributed as a token of respect to the visitors. He calls an attendant who brings the kava to the visiting talking chief. The visiting talking chief acknowledges the respect paid them. He then holds up the pieces of kava root and calls the attention of the chief of his party to them by saying, "Silasila mai" (Look). He names his chiefs in order of precedence and also enumerates the number of pieces of kava root. He then proceeds to *pule* (rule) over the distribution of the pieces of kava, allocating certain ones to certain chiefs and taking out his own share. Some of the smaller pieces he may throw on the mat before him, calling to one of his own attendants to take them away to beat for a bowl of kava. In this he may have been anticipated by the local talking chief. It matters not, it serves for the next bowl.

While the kava is being pounded outside, the taupou takes up her position behind the bowl and the village talking chief commences his official speech of welcome on behalf of the village. Meanwhile the pounded kava is brought in and the preparation proceeds. The visiting talking chief replies. In both speeches the orthodox *fa'alupenga* is again gone through as the correct commencement. The reply generally finishes before the kava is ready. If not, the village maid prolongs the straining. The distributor has taken his place on ordinary oceasions, or is now appointed if the meeting is a special one. He gives his first call irrespective of who is speaking and this temporarily ends the speeeh. The kava is then served. The serving over, the village maid usually retires and the speeches are eontinued. After the speeehes, the food is brought in.

On ordinary occasions though few may be present, someone always does the calling, the hands are clapped and a cup bearer serves the kava. In small family gatherings I have heard the chief's wife calling the kava. Walking through a village, a stranger is often accosted by a local chief calling from his house or coming out into the road to invite him in to rest and partake of the *'ava 'ona*. Kava is the universal medium of hospitality. It corresponds to the tea, coffee, or alcohol of higher cultures as a means to ordinary social intercourse and it forms the introduction to all ceremonies and matters of great pitch and moment.

Forms of kava. A number of names are given to kava for special purposes and various usages. The following list is not exhaustive.

The *'ava oso* is the kava root taken by people on a tour or journey to give to the chiefs of the villages they visit. During the Bishop Museum malanga the leader gave out kava which had been purposely taken down from Hawaii and was thus favorably commented upon.

Early morning kava (*pongipongi*) is usually prepared for people on a journey as they leave very early to avoid the heat of the day. On our malanga (tour), the white chief of the expedition preferred early morning coffee, somewhat to the disappointment of our senior Samoan talking chief, who was an inveterate kava drinker. At one village, the latter was heard asking the local talking chief why no *'ava pongipongi* had been prepared. On being told that it was through fear of waking the visitors at the early hour of 4:00 A. M., our thirsty talking chief severely admonished the local orator for departing from ancient Samoan custom. The *'ava pongipongi* was the only refreshment possible in the early morning. Visitors left after it and relied on getting breakfast at the end of the journey.

The *'ava mata* is green kava freshly dug up as a present of the highest respect to visitors. If an important malanga does not receive green kava, it considers that it has been treated with lack of respect. The kava with stems and leaves attached and earth still adhering to the roots is carried in by bearers uttering yells (*ailao*) as they emerge from the trees at the back. They march round the guest house and deposit the burden on the house platform in front of the middle section of the house with the call of "'O le lau 'ava" (The leaf of the kava). The kava is given by high chiefs. The clumps are afterwards trimmed, cut up and taken away by the visitors to be dried at home. The *'ava mata* was given to our malanga at Leone, Nua, and other of the Tutuilan villages. It also figures in important feasts as at the ceremony connected with Misa's house on Ofu.

The *'ava uso* consists of a number of long, thin roots which are bundled together. It is presented to a visiting relative who has not been seen for a long time. The term *uso* means brother and *'ava uso* signifies the uniting together again of long separated relatives. The custom was seen at Safotu, Savaii, where Mr. Stehlin, who accompanied me, was related to the wife of the talking chief Timu.

At Vailoa, Tutuila, the *'ava uso* was given to our malanga by the chief Satele and his people. On the malanga our leader, Mr. Judd, occupied the position of high chief and as such could not officially explain the objects of the visit of the Bishop Museum expedition. This duty was delegated to me and I acted as an assistant talking chief. Our senior Samoan talking chief did the talking demanded by Samoan etiquette while I followed up with an explanation of the aims of Bishop Museum in Polynesian research. The

brotherhood of the Maoris, Hawaiians, Samoans, and other branches had been touched on at the various villages. Vailoa was the last village of our fortnight's tour. Reports of our meetings had reached Vailoa ahead of us. As a mark of their recognition of our brotherhood—for both Mr. Judd and Mr. Cartwright were looked upon as Hawaiians—the Vailoa people determined to give us the *'ava uso* instead of the *'ava mata*. As we sat in the Vailoan guest house awaiting our hosts, our two Samoan talking chiefs saw the local chiefs in a house near by tying the long thin roots of *'ava uso* together. They therefore anticipated things by changing my *'ava* cup name to Fetaia'i-ma-uso (the meeting together of brothers). The *'ava uso* was duly presented with the other kava root. During the serving of the kava shortly after, the calling of the cup name surprised and pleased our hosts. In giving the *'ava uso*, the singing of a special song referring to it usually forms part of the ceremony.

Kava prepared for warriors before going to war is *'ava mua au*. Fe'epulea'i Ripley saw the custom in Upolu during the Samoan troubles of some years ago. The armed warriors lined up along each side of the road and the kava bowl was set up in the middle of it. Only the chiefs were served with *'ava mua au*.

Special ceremonies with varying details of procedure were built up around the installation of high chiefs and different districts seemed to have vied in elaborating a form of ceremony peculiar to their particular title. This was particularly so in connection with the high titles that have been designated as *tupu* (kings). Thus, in the high ceremonial connected with the Tui Manua, a number of cups were served. It sounds an extraordinary feat to drink so many cups, but after the first real cup the following cups contained merely a few drops. Even the mere touching of the receiving cup by the serving cups which were carried around was counted as a cup. It was number and not quantity that formed the basis of a special ceremony to add prestige to the rank of the high chief thus honored.

STATUS OF KAVA

Kava was the only beverage the pre-European Samoans had besides water and coconut water. It is cooling, refreshing, and stimulating without being intoxicating. Its medicinal properties are recognized by the medical profession and some of the well-known drug firms make up preparations of kava. Used in moderation, it is probably the best drink for a tropical climate. Continued use creates a habit, and drunk to excess it may affect locomotion but does not cause intoxication like alcohol. Continued use of large quantities results in a scaly skin affection and chronic conjunctivitis (*mafuna*), to be sometimes seen in old talking chiefs, who by reason of their office drink more kava than others. (See Churchill's account of the kava ceremony [7].)

To the Samoan, kava was far more than an ordinary beverage for quench-

ing the thirst. It is the first medium by which hospitality can be extended to guests and by which all consultations, agreements, and conferences can be commenced. Election to the title even of matai carried the right to sit amongst the gathering of chiefs and have one's title called out as the kava was served. By the order of serving, the precedence of the various chiefs was demonstrated. In the special kava ceremonies attention was further directed to the rank and status of the title being honored and its importance thus accentuated. It is doubtful whether any other culture has elaborated a more thorough method of advertising rank and station by such a simple medium. The *tungase* dried root also formed the official medium of paying respect to visitors and titles. Some of the large *tungase* were never meant to be pounded but passed from one recipient to another as each in turn paid his respects at subsequent ceremonies. Kava thus ranks as perhaps the most important material element in ceremonial and has become an integral part in the social fabric. If the ceremonial calling of kava were dropped, the value of titles would depreciate considerably as they would lose the most active factor that keeps them prominently before the eyes of the Samoan people.

PLAITING

Plaiting forms one of the most important crafts of the Samoans. Plaited roof sheets are used in the canoe sheds and cooking houses, plaited ridge sheets in all houses, plaited carrying sheets for bringing the sugar-cane leaf for the roofing of the better class of houses, and plaited wall screens for all dwelling and guest houses. The furnishing of houses is still incomplete without the plaited floor and sleeping mats. In connection with food, plaited baskets are a necessity for both transporting and storing cooked and uncooked food, while plaited trays are used in serving the meals. In providing clothing, apart from simple kilts and bark cloth, the technique availed of was entirely plaiting.

To appreciate the part played by plaiting in material culture, it must not be confounded with weaving. Plaiting is an older and simpler craft than weaving. As it dealt primarily with wider and stiffer strips of material than those usually used in weaving, the fingers were quite able to deal with the problems of technique encountered without seeking mechanical assistance. Plaiting in a technical sense means the interlacing of two sets of elements to form a continuous surface. The fabric or object made is usually of some extent. It may be kept flat as a sheet or mat, slightly concave as a tray, or the directions of plaiting may be so arranged as to form a receptacle or basket. The term plaiting is also applied to braiding. In braiding only a few elements are used and during the process of interlacing they are turned in successively at the sides to restrict the width and produce length.

Weaving resembles plaiting in using two sets of interlacing and inter-

crossing elements to form a fabric. It resembles plaiting further in the manner in which the elements cross in check or twill strokes. The difference, however, consists fundamentally in the method of arranging the crossing elements at the commencement edge of the work. If we take a coconut leaf, the leaflet elements are already arranged by nature along a commencement edge formed by the leaf midrib, but they run diagonally in one direction. To provide a crossing set, the plaiter must commence at one end and bend the alternate leaflets in the opposite direction as she works along the already provided and fixed commencement edge. Where nature does not provide a commencement edge in the form of a midrib, the separate individual elements are added by crossing them in the two diagonal directions along a commencement edge that is formed by keeping the initial crossings in the same line. An element of each set demands attention in turn and it is the immediate interlacement and intercrossing of each pair with those preceding that fixes them in position and enables another pair to be added. When the commencement edge is completed for the width of the article, all the elements required will have been added along one line and divided into two sets that cross each diagonally in front of the worker. With reasonably stiff and wide elements, the technique of continuing the intercrossing and interlacing is simple. With softer and narrower elements, plaiting becomes difficult, not so much from the interlacing as from the liability of a large number of fine, soft elements to become tangled together.

Weaving is a technique developed in dealing with soft, pliable elements. The difficulties involved in fine plaiting were obviated by dealing first of all with one set of the crossing elements. This set of elements (warps) was fixed to some support or supports at one or both ends. The other set of crossing elements (wefts) was attended to as a single element at a time. Hence at the commencement edge only one set of elements was fixed together vertically or longitudinally to the worker. These were diverged into two sets, according to the stroke used, and one weft element carried across between them at right angles to the warp and transversely to the worker. Apart from the use of mechanical contrivance and the nature of the material, the fundamental difference between plaiting and weaving begins at the very commencement edge of the article in process. The above recapitulation is necessary to a clear understanding of the technique of Samoan textiles.

TERMINOLOGY

The terminology used here is the same as that in the work on the Cook Islands (39, pp. 104, 105) with slight additions.

Check: each weft passes alternately over and under each consecutive crossing weft.

Decoration: the addition of elements for the purpose of ornament; *a*, ap-

plied, where the elements are not essential to the construction; *b,* structural, where the elements form an integral part of what they adorn.

Foundation wefts: a structural weft that is essential to the construction.

Overlaid plaiting: wefts not essential to the construction that are laid on the foundation wefts and are plaited with them to form applied decoration.

Shed: the space formed by the separation of the two series of alternate dextral wefts for the reception of a sinistral weft, or two series of sinistrals to receive a dextral.

Stroke: the passing of a weft over or under one or more crossing wefts to produce the pattern and technique of the plait as in check or twill.

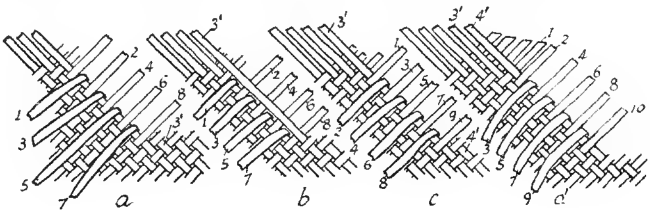


FIGURE 75.—Working edge, check plaiting: *a,* the dextrals 1 to 8 are termed *working dextrals.* Of these, the alternate series (1, 3, 5, and 7) have been turned back and the other alternate series (2, 4, 6, and 8), left down. This forms a shed for the next sinistral (3′). *b,* The next sinistral (3′) is placed in position. The movement will be completed by straightening out the turned back series over the sinistral and picking up the others; *c,* the movement is commenced from the top by straightening out (1), picking up (2) and so alternately until the series (1, 3, 5, and 7) have been straightened out over the sinistral (3′) and the series (2, 4, 6, and 8) picked up from beyond the edge of the sinistral. The check technique has thus been carried out and several strokes made by one continued movement. At the same time a shed has been formed for the next sinistral (4′). *d,* In the next movement, the dextral (2) is replaced and the weft next to it (3) is picked up, and so down the series. It is thus seen that the top weft of the last working series (1) has been dropped out but as the working series has to be kept up to the working number of eight, the next dextral weft below (9) has to be picked up to form the raised series (3, 5, 7, and 9). In this way the diagonal working edge keeps the plaited section level as it moves to the right by dropping the top dextral and picking up a new dextral from below. The following terms may now be understood.

Twill: each weft passes over and under more than one crossing weft. In twilled twos, it passes over and under two crossing wefts; in twilled threes, over and under three crossing wefts. Combinations may be used with a check, as three and ones, or with another twill, as threes and twos.

Weft: a technical factor in plaiting. A weft may consist of a single strip of material or more than one strip as in overlaid plaiting or in narrowing where two wefts are brought together.

Double weft: the term "double weft" is used where two separate weft strips are placed together for a special purpose in technique but they are treated as a single factor in the plaiting strokes and movements.

Dextral and sinistral wefts: the confusion between using the terms warp and weft which belong to weaving is obviated by terming the strips which lean towards the right, dextral wefts, and those towards the left, sinistral wefts. When a weft is turned in the opposite direction, as in defining the edge of the fabric, it is renamed from the direction in which it functions. If distinction is required, it may be termed an acting dextral or sinistral as it may be.

In actual plaiting, single strokes in check or twill are not made except in special circumstances. To facilitate the work, as many dextral wefts as can be conveniently handled are treated by separating them into two alternating series to form a shed into which the appropriate sinistral is placed. (See fig. 75.)

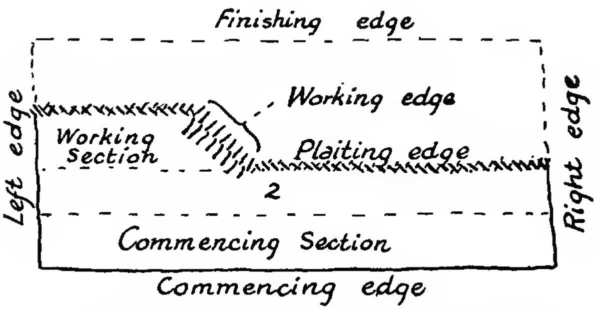


FIGURE 76.—Plaiting sections. For ease of description the following terms will be used: The bottom or near edge of the first or *commencing section* is the *commencing edge*; the far edge of the last completed section (2) is the *plaiting edge*, as the next section has to follow along it; the far edge of the last section of all is the *finishing edge*, as it has to have a special finishing technique; the section being plaited is the *working section*; its right oblique edge is the *working edge*, composed of a number of working dextrals; the *left* and *right edges* are obvious.

Movement: a technical movement in plaiting consists in placing a sinistral weft in the shed provided by a previous movement, lowering and raising the two series of working dextrals to complete the plaiting strokes and, as a result, prepare the shed for the next sinistral.

As used here, the definition differs in the order of the two parts of the completed movement to that enunciated in my work on the Cook Islands (39, p. 105).

Working dextrals: the dextral wefts raised and lowered at the working edge to provide a shed for the sinistral weft.

Working edge: the oblique edge formed by a sinistral weft and the working dextrals. The working edge varies in length according to the number of working dextrals being used.

The plaiting of a deep surface is therefore carried out in a series of sections. The width of the section is the full width of the article being made, as

it commences at the left edge and working to the right finishes at the right edge. The depth of each section is determined by the number and width of the working dextrals used at the working edge for the same number of working dextrals is maintained throughout for that section. The left and right edges are built up with each section. (See fig. 76.)

The distinction between plaiting and weaving is now more obvious. The dextral wefts in plaiting correspond in function to the warps in weaving for they are the elements that are separated into two series to provide a shed for the sinistral weft in plaiting and the weft in weaving. In weaving, all the warps along the commencing elge would be separated to form a shed extending for the whole width of the fabric, whereas in figure 76 it is only the relatively small number of working dextrals at the short oblique working edge that do this in plaiting. This goes back to the fundamental arrangement of the elements at the commencing edge.

MATERIAL

The material used in plaiting house accessories, food platters, and baskets, and the commonest form of floor mats, is the leaf of the coconut palm. For other baskets and mats, recourse is had to the pandanus.

The coconut leaf. The coconut leaf is termed *lau niu* (*lau,* leaf, and *niu* coconut) while the leaf midrib is *lapalapa.* The upper surface of the leaf is the *alo* (front) and the lower surface the *tua* (back). The leaf midrib is four sided for about half its length. The lower surface is wider than the upper. All surfaces diminish in width towards the tip end. At about halfway, the converging edges of the upper surface run together and continue on as a raised ridge, while the two lateral surfaces and the under surface persist, thus making the tip end half of the midrib triangular in section. The leaflets are symmetrically arranged on either side and spring from the lateral surfaces of the midrib. They run obliquely outwards and towards the tip end of the leaf. Each leaflet has a strong midrib which is attached to the lateral surface of the midrib just below its upper edge. At its attachment it runs a little backward towards the butt end and then merges in the leaf midrib. The leaflet midrib is termed *tuaniu* and is used for various purposes, such as needles and for sewing roof sheets of sugar-cane leaf. The leaflet material on either side of the leaflet midrib come together at the leaf midrib and are attached to its lateral surfaces in a vertical line extending downwards from the leaflet midrib. In certain forms of sheets and baskets, the leaflet midrib is pressed down with the thumb to open out the leaflet to its full width. In technique, this will be referred to as the "open leaflet." In other forms of sheets and baskets the leaflets as wefts are not opened out but kept doubled throughout with their midribs forming an edge of the weft. For distinction, this will be called the "closed leaflet." The young leaves in the middle of the

leaf head that are not opened out are called *moemoe* (sleeping). The young, soft leaflets become very white when dried and are used in making the white *ilitea* fans.

The formation of the leaf influences technique. The leaf midrib readily splits longitudinally and excess material is split off from the lateral surface strip bearing the leaflets. The midrib strip forms a natural commencing edge with the wefts already fixed in position. With the *alo* surface upwards and the midrib strip towards the worker, the strip from the left side of the leaf (*itu tauanga vale*) has the butt end towards the left and the leaflets incline towards the right, thus forming natural dextral wefts. With the strip from the right side of the leaf (*itu taumatau*) in the same position, the butt end is towards the right and the leaflets incline towards the left, thus forming natural sinistral wefts.

HOUSE ACCESSORIES

The plaited materials used in connection with actual house construction are thatch, carrying sheet, ridge, and screen sheets. They are all made of coconut leaf and illustrate various phases of simple plaiting.

Thatch sheet (*laupola*). The coconut leaf sheet is used for thatching, canoes, cooking, and rough, temporary houses. The leaf is cut off into convenient lengths of 6 or 7 feet and split down the leaf midrib. Excess midrib material is split off. The position of plaiting is with the midrib strip towards the plaiter and the natural upper surface upwards. The open leaflets are used as wefts and the plaiting stroke is the check. Each half leaf is dealt with differently.

Left half leaf. The left half leaf, forming natural dextrals, is plaited from left to right. It is obvious that in a check plait, alternate leaflets must be bent to the left to provide crossing sinistrals and that the leaflets will be dealt with in pairs. It is characteristic, however, of Samoan technique that the first leaflet is left out of the pair groupings. (See fig. 77.)

Pinning the outer edge. A neat method of keeping the leaflets in position at the far edge of the plaiting is shown in figure 78.

This is quickly and easily done, here and there, along the free edge of the plaiting and, though not absolutely essential, helps to make a well-balanced sheet.

Right edge finish. When the plaiting reaches the right end of the leaf strip, the right edge is formed in the same manner as on the left but it is the dextrals which project beyond the last sinistrals that are turned in. (See fig. 79.)

Right half leaf. In the right half leaf with natural sinistrals, plaiting technique departs from the usual and commencing on the right works towards

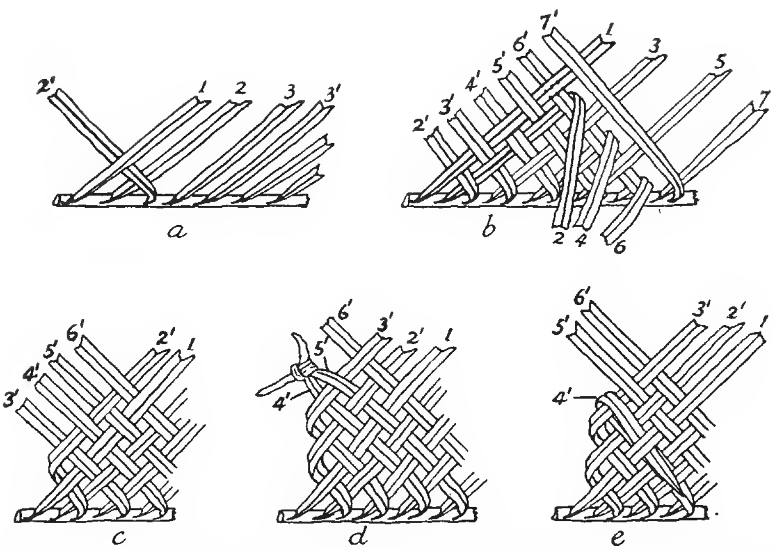


FIGURE 77.—Roof sheet technique (*laupola*), left half sheet: *a*, the first leaflet (1) is raised and the right leaflet of the first pair (2′) is bent over the left member of the pair (2) to form the first sinistral and pressed down with the thumb to open it out. After it has passed back, the first leaflet (1) is dropped down over it to maintain the check technique; *b*, for the next movement, the right hand member of the next pair (3′) is bent back over (3) after (2) has been raised. As (2) is dropped over (3′), the dextrals on either side of it (1 and 3) are raised with the left hand and the right member of the next pair (4′) bent back into position. The dextrals (1 and 3) are then dropped over it. As (1) is dropped, the next dextral below it (2) is picked up. As (3) is dropped, the next dextral (4) is also picked up. A shed is thus formed for the next sinistral, which is the right one of the next pair (5′). The sinistral (5′) is bent back into position. The left hand is still holding up the dextrals (2 and 4). Before (2) is dropped, the dextral above it (1) is picked up, then (2) is dropped, the dextral below it (3) is picked up, the dextral (4) is dropped and the next dextral (5) is picked up. It is seen that the left hand picks up and drops the dextrals alternately to maintain the check. The shed for the next sinistral weft (6′) being prepared, it is bent back over its left neighboring dextral (6). The dextrals (1, 3, and 5) have been held up but as each is dropped over the sinistral (6′), the alternate dextrals (2, 4, and 6) are picked up to form the shed for the next sinistral (7′). This is the position shown on the right of the figure. The depth of plaiting is now sufficient for the sheet. In rearranging the dextrals to cover the sinistral (7′) and prepare the shed for the next sinistral, the order commencing always from the top is 2 down, 3 up, 4 down, 5 up, 6 down, and 7 up. The dextral (1) immediately above the first dextral put down (2) is not picked up as the depth of plaiting is now sufficient. A full working edge is now established with three dextrals down and three raised. With each movement, the uppermost dextral of the last series is left down and a new one added by the left element of the new pair over which the new sinistral is bent. In this way the plaiting moves from left to right across the full length of the leaf strip. The left edge may be finished off as soon as the full plaiting depth is reached or while it is being built up. The left end of the sheet shows the ends of the sinistrals projecting beyond the first dextral (1). *c*. The lowest projecting sinistral (2′) is bent at right angles to form an acting dextral by giving it a half turn which exposes its other surface. It is passed over the sinistral above it (3′), and therefore the alternate sinistrals (4′ and 6′) are raised to allow it to pass under them. *d*, The next projecting

sinistral (3′) is next bent at right angles and passes over the near sinistral (4′) and under the next (5′). This last movement completes the depth of the plaiting. In order to keep the bent in wefts from springing back, the sinistrals (4′ and 5′) are tied over the last bent weft (3′) in a reef knot. *e*, Instead of tying a knot, the sinistral (4′) may be doubled back over the last turned in weft (3′) and passed under the first convenient crossing weft on its course (1).

the left. As before, the first leaflet is left out of the pairs. Of the pairs, the leaflet on the left is turned by the left hand back over the right element to form a dextral. Here it is the right hand that arranges the sinistrals into two alternate series to form a shed for the bent-back dextral. As regards technique, therefore, everything is the opposite to that with the left half leaf. (See fig. 80.)

The left edge of the sheet is turned in in exactly the same way as the left edge of the left half leaf.

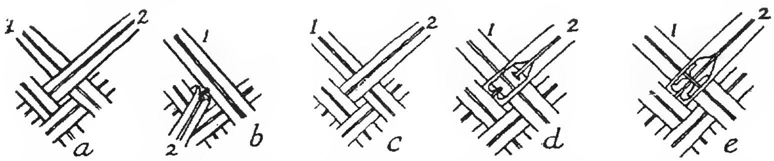


FIGURE 78—Pinning leaflets, roof sheet: *a*, in the leaf strip being plaited, the sinistrals as shown by (1) have a tendency to straighten out towards the right owing to their having been bent in from that direction. This can be counteracted by a dextral weft (2) which crosses above it. *b*, The dextral (2) is bent back and its midrib pinched through with the thumb nail at a point well on the near side of where it crosses the leaflet midrib of the sinistral (1); *c*, the dextral (2) is straightened out and the lower end of the upper section of midrib pushed through the sinistral weft (1) on the far side of its midrib; *d*, the leafy part of the dextral (2) is cut away to show how the midrib end passes through the leafy part of (1); *e*, the leafy part of the sinistral (1) is cut away to show how the midribs lock.

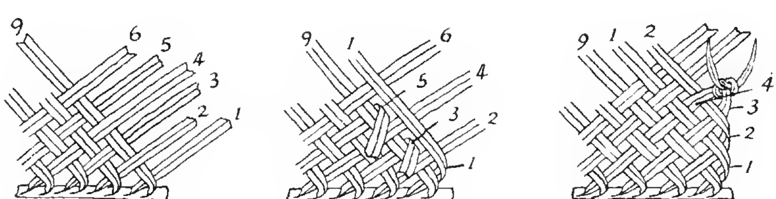


FIGURE 79—Roof sheet, right edge finish: *a*, the sinistral (9) is the last or marginal one while of the dextrals which project, the turning in commences with the lowest (1); *b*, as the lowest dextral (1) has to be turned in over the dextral (2) to maintain the check, the alternate dextrals (3 and 5) are raised and the turned in weft (1) placed in position; *c*, the raised dextrals (3 and 5) are placed over the acting sinistral (1) and the alternate (4) raised. The next dextral from below (2) is bent in over (3) and after dropping (4) over it, the two dextrals (3 and 4) are knotted together to prevent unravelling.

By keeping the same number of working wefts at the working edge, the completed plaited edge of the sheet is level throughout and is left thus without further treatment. The plaiting is enough to rearrange the leaflets by crossing them and keeping them in that position. Before thatching, the sheets are usually left out exposed to the sun for a day or so to partially dry and shrink them. A right and left sheet are placed together and treated as one element in tying to the thatch rafters. (See Pl. XI, *A*.)

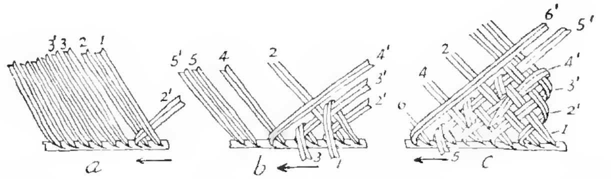


FIGURE 80.—Roof sheet technique, right half sheet: *a*, the first leaflet on the right (1) is raised, while the left leaflet of the next pair (2′) is passed back over the sinistral (2) and under (1); *b*, in the next movement, the sinistral (1) was left down, the next on the left (2) raised and the left (3′) of the next pair bent back over (3), under (2), and over (1). For the next movement, the alternate sinistrals (1 and 3) are raised and (2) left down while the next dextral (4′) is turned back over (4 and 2). For the next movement (1 and 3) will be dropped over the dextral (4′) and the alternate sinistrals (2 and 4) raised. The weft (5′) will then be turned back as a dextral and so the plaiting will work towards the left. *c*, The required depth having been reached after the plaiting of the dextrals (4′ and 5′), the right edge is defined by first turning in the dextral (2′) and then (3′). The next dextral (4′) is doubled back over (3′) and passed under a crossing weft (1) to lock the edge.

Carrying sheet (*laupolapola*). The carrying sheet (Plate XII, *E*) is used as a broad band upon which material such as cane leaves is placed. The ends of the sheet are brought round and tied over the bundle with a strip of bark. The burden (*avenga*) so formed is carried on the back by women in the *fafanga* method.

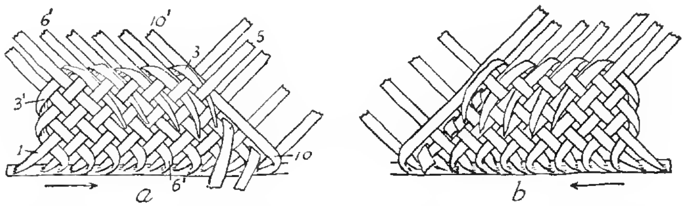


FIGURE 81.—Carrying sheet, plaiting of half sheets: *a*, in the left half leaf after the left edge has been turned in and the depth reached, each dextral weft after reaching the plaiting edge, is turned forward at right angles, and placed on the sinistral which has been laid in the shed formed at the working edge. The turning down movement is called *afe*. Thus the acting dextral (3′) having reached the required depth is turned forward on the sinistral (6′) after it is laid in its shed. On the completion of the movement, the dextral (3′) is crossed by the top raised dextral (1) and its lower end lifted up while the following dextrals are passed over the sinistral (6′). The dextral (3′) is thus kept out of the way of the plaiting edge for the time being and is crossed by only

one weft in order that it may be easily pulled out later. There is no confusion as to which sinistral the dextral should be turned down on, as it is the one which meets the dextral at the plaiting edge. This is continued throughout. The dextral (3) is shown turned down on the sinistral (10′) which has just been placed in the shed at the working edge. It has been crossed by the top raised dextral (5) and turned back out of the way to prevent being caught under the following raised dextrals which have yet to cross over the sinistral (10′). It is obvious that in turning down one set of crossing elements from the plaiting edge, it can only be the set which is inclined towards the working edge. In the left half sheet, the set can only be the dextrals. If the sinistrals are turned down at right angles from the plaiting edge, they fall on the already plaited part and cannot be included under any element that is being worked. To push them under a crossing element that has already been worked would necessitate taking the fingers away from the working edge and thus cause delay. *b*. The right half sheet is plaited in the orthodox way from right to left. Following the principle enunciated above, the set of elements to be turned down from the plaiting edge must be the sinistrals as they are the elements which incline towards the working edge.

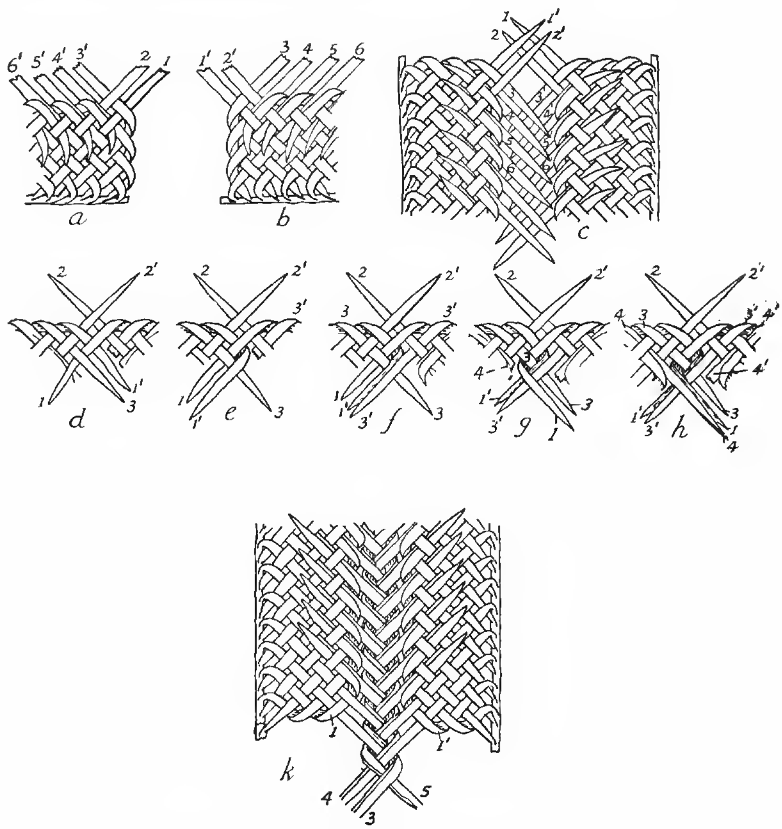


FIGURE 82.—Carrying sheet, joining half sheets (first course): *a*, the right end of the left half sheet is shown numbered afresh. The end dextral (1) could be turned up over (2) to function as a sinistral but, as there is no crossing element to hold it, it is left for the time being. *b*, the left end of the right half sheet is also numbered afresh

and the first sinistral (1') left projecting. *c,* The advantage of tucking down one set of elements in each sheet is clearly seen. It avoids confusion at the plaiting edges. By placing the left half sheet on the right, the projecting sets of elements from either are directed towards each other. As they have to be plaited together in a three-ply braid, they fall naturally into position. *d,* Commencing at the far end, the first weft from the left (1') is turned in over (2') to complete the check and diagonally over the middle line. The first weft on the right (1) is picked up from under (2'), turned in over (2) to complete the check, and crossed over the first ply (1'). Turning now to the left, the projecting weft (2') is left alone and the first of the downward directed wefts (3) is lifted up and crossed over (1). We have now the three plies to commence the braid. A braid is worked by twisting the back element of the pair across that in front of it to the middle position and then adding a weft from the same side of the plaiting edge. *e,* The first movement is to twist the back element of the pair (1') over (3) to the middle position; *f,* the weft (2) is left projecting and the next weft (3') is added to the twisted over ply (1'); *g,* the pair is now on the left so the back element (1) is twisted over the double ply in front of it; *h,* the next projecting weft on the left (4) is added to the middle ply. The technique is now established. The next movement is to turn the back element (3) over that in front to the middle and then add (4') to it. The plies thicken but it makes no difference to the braiding. As each element is added from the side to the middle ply, it is pulled so as to bring the plaiting edge in close to the braid. *k,* The braiding is continued to the near end of the half sheets. When all the free wefts have been included in the braid, the braiding is continued on as a free tail for a few strokes.

A section of the coconut leaf about 2 feet long, split in two, forms the material. The two half sheets are plaited separately in check with the open leaflet in the same way as the preceding roof sheets with this addition. (See fig. 81.)

Joining the sheets. The two sheets are now joined together at their plaiting edges with a three-ply braid which is plaited in two courses. The two sheets are therefore placed longitudinally in front of the worker with their plaiting edges close together and the first course of the braid commenced. (See fig. 82.)

The first course of the braid being completed, the ends of the sheets are reversed to place the braid tail at the far end and the second course commenced. (See fig. 83.)

An alternative technique consists of plaiting the leaflets on the two sides of the leaf section without splitting the leaf midrib. After plaiting each side, the two plaiting edges are joined together by the two-course braid and the leaf midrib split last of all to open out the sheet.

In use, the true under surface of the leaflets are turned upwards as this surface forms a natural concavity. The material carried is longer than the carrying sheet but the broad band is quite effective in keeping it together. Bark strip ties are passed between the midrib edges which need not necessarily meet.

Roof ridging sheets. *Taualunga* is the general term used for roof ridging. It includes the ordinary unplaited coconut leaves which are placed horizontally

along the ridge to fill up the space between the top row of thatching on either side and the upper ridgepole, as well as the plaited sheets used as the final cover. Terms are sometimes used incorrectly but the older Samoans were careful in pointing out that the plaited sheets are termed *fa'atafiti* which form only a part of the *taualunga*.

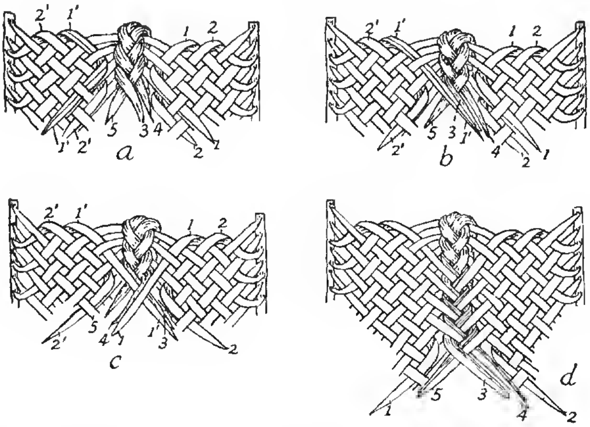


FIGURE 83.—Carrying sheet, joining (second course): *a,* The free braid is doubled over and its plies indicated by 3, 4, and 5. The ends of the wefts (1' and 2') on the left and (1 and 2) on the right have been turned back out of the way. When they are pulled out from under the single crossing wefts and straightened out in their natural direction, it is obvious that the wefts from both sides will incline towards the plaiter. They are pulled out alternately from each side and brought in over the middle ply of the braid. The weft (1') on the left when pulled out will be in the same line as the middle ply (3) of the braid, so the plaiting may commence. *b,* The first turned down weft on the left (1') is pulled up and laid on the middle ply (3). *c,* The back ply of the pair (4) is twisted over the middle ply (3) with the incorporated weft (1'). The turned down weft on the right (1) is pulled up and laid on the middle ply (4). The next movement will be twisting the back element of the pair (5) over the ply (4) with the weft (1) to the middle position. The next turned down weft on the left (2') will then be pulled up and added to the middle ply (5). *d,* The established technique is continued as shown. The next movement is to pull out the left weft (1) and add it to the middle ply (3). The back ply (4) will then be twisted over and the right weft (2) added to it. The braid is continued down the full length of the sheet and all the turned down wefts thus added to the second course of the braid. At the end, the braid is continued as a free tail and finished off with an overhand knot. The tail is twisted around to the under surface and the knot pushed through under a crossing weft to keep it in place.

The *fa'atafiti* ridging sheet is made of two coconut leaves, one of which is split down the midrib into two halves. Plaiting takes place with the true under surface turned upwards. The whole leaf occupies a middle position. The half sheet whose leaflets cross naturally with those on the right side of the whole sheet is placed on the right with the leaf midribs parallel and about 8 inches apart. The crossing leaflets are plaited and then the remaining half sheet is similarly treated on the left. In plaiting, two adjoining closed leaflets

from the same midrib are treated as one weft. Whichever of the two leaflets is placed above at the commencement must maintain that order in all succeeding pairs. (See fig. 84.)

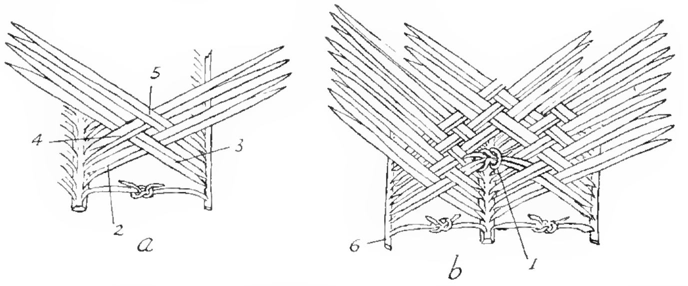


FIGURE 84.—Ridging sheet (*fa'atafiti*): *a*, Whole sheet on left; half sheet from left side of a whole leaf placed on the right so that leaflets cross naturally. The lowest dextral pair (2) from the whole leaf is crossed by the sinistral pair (3) from the split midrib. The next dextral pair (4) is crossed above the sinistral pair (3) while the next sinistral pair (5) is lifted over (4). In this manner the single plait, or crossing arrangement, is continued alternately from side to side along the middle line between the two midribs. When the leaflets become too short, towards the top ends of the leaves, to maintain the even balance of the sheet, leaflets from each side are tied together in a reef knot as at the commencement; *b*, The other half sheet (6) is laid in position on the left and supplies dextral wefts to cross the sinistral wefts from the left side of the whole sheet. The lowest leaflets are knotted and the crossings take place as on the right. It is more awkward plaiting on the left, as the leaflets from the right half sheet project across the middle midrib, but they are readily lifted out of the way. On completing the two sides, the leaflets from each half sheet cross each other above the middle midrib. The two lowest wefts are tied in a reef knot over the middle midrib (1) and the crossing leaflets are arranged in order over the middle in exactly the same manner as the two sides. At intervals, two crossing wefts are tied in a reef knot to prevent the midrib of the half leaves working out from the middle midrib.

The completed ridging sheet is shown in Plate XI *B*. The unplaited tip ends of the leaves are not cut off but are left to be covered by the plaited parts of other sheets. The sheet when turned over has the appearance in Plate XI *C*, and it is this surface that is to the outside when the sheet is fixed on the ridge of the house. The outer split midribs thus keep the projecting leaflets down. The middle midrib lies along the top of the ridge and the split midribs hang down on either side. The wooden pins are passed through the sheet below the upper ridgepole and above the split midribs on either side, which thus prevent the sheet from working up over the pins. The ridging may have to be renewed before the thatch.

The wall screens (*pola sisi*) used to close the sides of the house show a further advance in plaiting technique. The crossing elements are supplied by two strips of midrib from opposite sides of the leaf; twill strokes are used instead of check and the finishing edge opposite the midrib commencement is formed by a three-ply braid.

The leaf sections are cut slightly longer than the spaces between the wall posts in order that the sides of the screens may overlap the posts when hung. The leaf sections are then left out to dry for a day or two. Before plaiting, the leaf sections are split down the midrib which is then pared in both halves. The length is checked with a measured rod. The right half leaf is placed above the other so that the lower layer of leaflets consist of naturally directed dextrals and the upper layer of natural sinistrals. There is thus no bending of alternate leaflets at right angles to their natural course for the crossing elements are provided naturally. The leaflets are kept closed. In the upper layer of sinistrals, the leaflet midrib forms the left margin of the wefts and in the lower dextrals, the right margin. The commencement (*fa'a'au*) is made by plaiting the crossing elements together with one row of twilled-two strokes (*su'i lua*) along the length of the midrib strip. The technique is shown in figure 85.

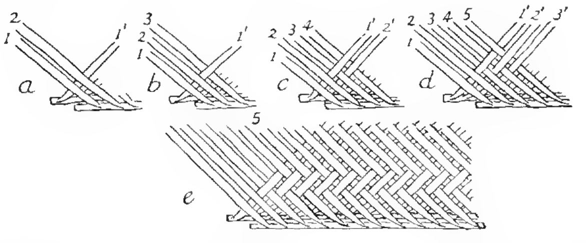


FIGURE 85.—Wall screen, commencement (*fa'a'au*): *a*, The first dextral on the left (1') is picked up with the left hand from below the first two sinistrals (1 and 2) on the left. *b*, Still holding up the first dextral with the left hand, the next sinistral (3) is passed under it. *c*, The left hand still retaining the first dextral, picks up the next dextral on the right (2') and holding them both up, passes the next sinistral on the right (4) under them. *d*. The left hand has now to pick up the next dextral (3') but, as it already holds two wefts and the stroke is to be a twilled two, it has to drop the first dextral (1'). Holding up the pair (2' and 3'), the right hand passes the next sinistral (5) under them. As the dextral (1') has been dropped, the sinistral (5), after passing under two crossing wefts, passes above the dropped dextral (1') and thus maintains the twilled two stroke. *e*, From now on, the technique is established. The left hand drops the upper or left element of the pair it holds and picks a new dextral from below or to the right. The right hand then passes the next sinistral under the raised pair of dextrals with the appearance shown.

In actual technique, the right hand holds a number of sinistral elements curved away to the right to display the dextral layer below. As the left hand picks up the new number of the pair, the right hand simply lets go the left sinistral of the bunch and it falls into its natural position. When the whole row is plaited, the leaflet ends of the two series are pulled so as to bring the midrib strip closer together and tighten up the plaiting. The whole process of this stage is termed the *fa'a'au*. As it is a common commencement, it will be referred to as the "twilled-two" commencement.

The side edges. Before the next section of the plaiting can be continued from the commencement plait, the left edge of the sheet must be defined. This is done as in previous sheets by turning in the projecting sinistrals successively at right angles to function as dextrals, but with this difference. In the roof and carrying sheets made with the open leaflets, the leaflet is given a half turn which exposes the other surface. In the closed leaflet wefts, the angular turn at the edge is made without turning the other surface upwards. The leaflet is simply bent in and the leaflet midrib still remains as the left edge of the wefts though the leaflet part is somewhat crumpled. This method of defining the edge is termed *afeafe*. (See figure 86.)

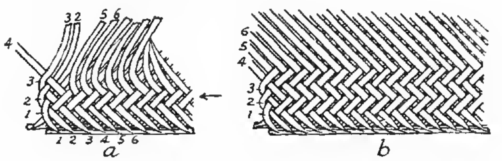


FIGURE 86.—Wall screen, side edges, horizontal twill (*afeafe*): *a*, The first sinistral (1) is turned in over the second sinistral (2), and passes under the next two crossing elements. The next sinistral (2) then passes over (3) and (3) in turn over (4). Above this all the sinistrals show in the upper layer. The sinistral weft (4) is arranged so that it passes above two dextrals (the turned in sinistrals 2 and 1). The other sinistrals to the right commencing with (5) are gathered to the right by the right hand. It is obvious that the dextral (2) must be held up together with the one above it (3) before the next sinistral (5) can be dropped back into position to continue the twilled two plait. This is done. *b*, For the next movement, the upper of the pair (3) is dropped and a fresh dextral on the right (1) is picked up. The next sinistral (6) is placed in position. This technique is followed throughout, the upper of the pair of dextrals is dropped, and a new dextral picked up below and the next sinistral dropped back in position. Successive sections are plaited until the depth of the sheet is reached.

The question of whether the turned in sinistral passes above or below the sinistral above it, depends on the craftswoman, the method of beginning the plait, or the pattern to be followed. Thus in the screen figured in figure 86, the first dextral (1′) was brought up from under one sinistral (1) instead of two. The plaiter subsequently formed the left edge by turning the sinistrals under the ones above it. Before the uppermost sinistrals are turned at the edge, their position in the pattern between the twill of the commencement and the left edge must be attended to.

The right edge of the screen is defined with the completion of each section, by turning in the projecting dextrals successively to function as sinistrals with the *afeafe* turn.

The body. A decorative effect is produced by varying the plaiting stroke. There are three usual forms: *a*, horizontal lines of twill are simply a repetition of the technique of the commencement. The plaiting edge is defined by a horizontal line of dextral twilled twos shown by the arrow in figure 86 *a*. If twilled threes are used, three dextral wefts are held up instead of two.

Dropping the element above and picking up a one below will result in a horizontal line of twilled threes. *b,* Vertical lines of twill are shown in Plate XII *A,* 1. The usual commencement marked by the horizontal line of dextral

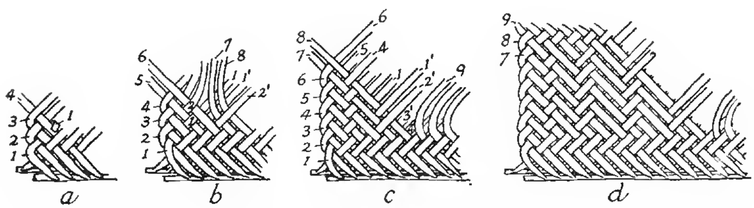


FIGURE 87.—Wall screen, vertical twill: *a,* Shows the first three sinistrals turned in, but, as the lowest (1) has passed under two wefts, it is lifted up before the next sinistral (5) is placed in position. *b,* The sinistral (4) is then turned in over (5) to act as a dextral. In arranging for the next sinistral (6) it will be seen that the acting dextral (2) has passed under two crossing wefts and it is accordingly raised while (6) is placed in position. The sinistral (6) has passed over three dextral wefts (1, 1′, and 2′). The lowest of these (2′) is lifted up to lie on the sinistrals. The formation of vertical twills can now be followed. *c,* For the next sinistral (7), the dextral (3) above the last raised (2) is lifted and (7) placed in position. The sinistral (5) has been turned in at the edge so that (7) passes above it. The sinistral (6) is also bent in over (7). Each sinistral from (6) upwards forms a lower twilled three and an upper twilled two. After each sinistral is laid in position the lower element of three dextrals crossed is lifted up on the right of the sinistral. Thus, after placing (7), the lowest dextral (1′) is lifted up. The next highest dextral (4) is lifted while the sinistral (8) is placed in position. Then the lowest dextral of the three (1) is lifted up from below the sinistrals which cover it. The placing of sinistral (8) is about as far as it is safe to go with the left edge. The sinistral has a long course from the plaiting edge formed by the horizontal line of twilled twos and the left edge. Once a sinistral is turned at the left edge, its course is fixed and alterations cannot be made without undoing the plaiting. Examination will show that next to the turn at the left edge, there is a vertical line of sinistral twilled twos followed by a vertical line of dextral checks and then sinistral threes. The sinistral threes are defined on the right by lifting the lowest dextral of the three after each sinistral crosses them as was done by (2′ and 1′). Therefore, before the next sinistral (9) can be placed in position, it must be decided what pattern is to be followed on the right of the sinistral twilled threes or what is to be done with the dextral (2′). The pattern followed on the right is dextral twilled twos and then sinistral threes. Hence, as the dextral (2′) has already formed a twilled two, it is dropped. The two dextrals above it (1′ and 1) must be raised to continue the line of twilled twos vertically. In any case, the upper of the two (1) had to be raised as it is the lowest crossed by the sinistral three formed by (8). The dextral (4) is dropped, as it is part of a vertical line of check, and (5) must be picked up. Hence to form a shed for the sinistral, (9), the dextral (5) is picked up, (4) dropped, (1 and 1′) picked up, and (2′) dropped. The others not mentioned are already down. *d,* When the sinistral (9) is laid in position, it will be found to have commenced vertical lines of dextral twos and sinistral threes on the lower end of its course. The continuation of vertical twos and threes is shown by carrying on the technique discussed. The depth of the pattern is bounded by a horizontal line of dextral checks commencing on the left edge with the turning in of weft (8) as a dextral over (9). It develops simply by dropping the first one on the left over the sinistral and picking up the next dextral on the right in forming a shed for the next sinistral.

twilled twos is made. The left edge is built up by turning in the sinistrals successively as dextrals to pass over one and under two crossing sinistrals. (See figure 87.) Patterns are developed horizontally by picking up dextral wefts to the right or below, and vertically by picking up the dextrals on the left or above. When the width of the sheet is reached, the right edge is formed by turning in the dextrals as sinistrals and placing them in the sheds formed with the dextrals which continue the pattern. *c;* Two forms of triangular geometrical patterns (*mamanu*) are in common use. (See fig. 88.) Smaller triangles (Pl. XII, *A*, 3) are worked in figure 89.

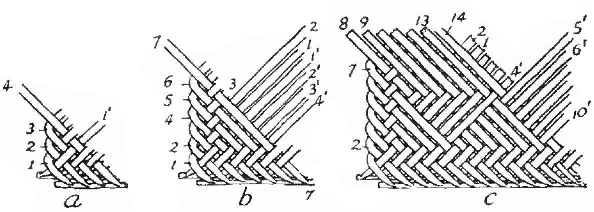


FIGURE 88.—Wall screen, geometrical pattern (*mamanu*). The larger triangles in Plate XII, *A*, 2, are worked out in figure 88: *a*, The twilled-two commencement varies in lifting up the first dextral 1′ from under one sinistral (1) instead of two. As a result, the first sinistral (1) when turned in to commence the left edge passes under the projecting sinistral above it. Each acting dextral turned in from the left edge passes under two crossing sinistrals and then over one, as shown by weft (1). *b*, Commencing with sinistral (4) the line of vertical dextral checks is continued up over four sinistrals (4-7). Between the commencing horizontal twilled twos and the vertical line of checks, the four sinistrals (4-7) have formed a triangular figure of which the right boundary is the sinisral (7). The four sinistrals forming the triangle have crossed respectively one, three, five, and seven dextrals. Of the seven dextrals crossed by the sinistral (7) the top one (3) is left down and the other six (2-4′) raised and held up by the left hand. c, The right hand now picks the next six sinistrals (8-13) to the right of the sinistral last used (7). The two series of six wefts are dropped into position alternately, commencing with the left sinistral (8) and the top dextral (2). Thus the sinistral (8) is dropped back into its natural lines and the top dextral (2) dropped over it. The next sinistral (9) is placed in position and the next dextral (1) dropped over it. Observe that the sinistral (9) passes over the dropped dextral (2). This is continued until the last or lowest dextral (4′) is dropped over the last or right sinistral (13). Note also that the sinistrals (8 to 13) have successively passed over the six dextrals (5′ to 10′). Two additional triangles have been quickly added to the design by the above procedure. The last sinistral (13) now forms the right boundary of a triangle in a similar way to the sinistral (7) with the first triangle. There is this difference: that the sinistral (13) has crossed only six dextrals instead of seven. The further development of the triangular motive is hence simple. The six dextrals (5′-10′) crossed by the bounding sinistral (13) are all raised by the left hand and the right hand picks up the next six sinistrals, which commence with (14). The alternate dropping of the two series is as before. Commencing with the left sinistral (14), the top dextral (5′) is dropped over it while the other five dextrals still are held up. The next sinistral (15) will be dropped and then the next dextral (6′) and so on until both series are exhausted. This results in two more triangles. The technique is thus continued across the full width of the sheet and the right edge turned in to comply with it. The left edge is further built and the depth of the sheet secured by additional horizontal lines of alternating checks or twills as suits the craftswoman.

Finishing braid (*fili*). The depth secured, the transversely placed plaiting edge is turned longitudinally, and braiding commences at the far end. Both the dextral and sinistral projecting free ends are alternately plaited into a three-ply braid to finish off the far edge of the sheet. (See fig. 90.)

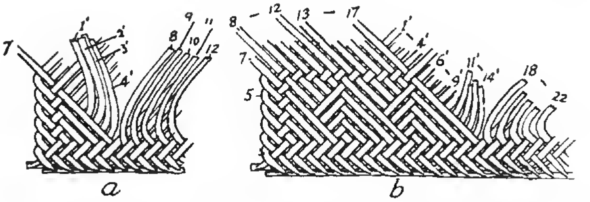


FIGURE 89.—Wall screen, geometrical pattern: *a*, The technique up to this stage is exactly the same as in figure 88, *b*. Now, however, instead of six, the four lowest dextrals (1′-4′) crossed by the bounding sinistral (7) are picked up by the left hand. Instead of six, the right hand picks up the next five sinistrals (8-12). Of the two sets of wefts, the first dropped is of necessity the nearest or left sinistral (8). The order of dropping the dextrals is now reversed to obtain a change in the arrangement of triangles. In the previous figure the top dextral was first dropped and resulted in the line of crossings being horizontal. In the present figure the bottom dextral of the set (4′) is first dropped over the first sinistral (8). The next sinistral (9) is next placed in position and the next dextral above (3′) dropped over it. Then follow the sinistrals (10 and 11) while the dextrals (2′ and 1′) are dropped over them respectively. The four dextrals are used up and the fifth sinistral (12) is dropped over them. *b*, The horizontal line of checks must be disregarded in the figure for the moment. The different order of dropping the dextrals has resulted in a vertical line of crossings which varies the pattern. The four lowest dextral wefts (6′-9′) that emerge from under the bounding sinistral (12) are lifted up in the left hand and the next five sinistrals (13-17) are grouped in the right. The two sets are again dropped alternately commencing with the left sinistral (13) and the lowest dextral (9′). This brings us to the right working edge of the figure. Here the four lowest dextrals (11′-14′) emerging from below the bounding sinistral (17) are grouped up in the left hand and the next five sinistrals (18-22) are picked up in the right. Commencing with the sinistral (18), the established technique is repeated. So by repetitions of the groupings of 4 lowest dextrals and the next 5 sinistrals, the triangular motive is carried across the sheet.

Returning now to the left edge, the turned in dextral (5) makes a check stroke over the sinistral (8). From this a horizontal line of checks is run towards the right over the full width of the plaiting. This defines the field of triangular motives and defines a further series of triangles with the bases upwards.

Above the line of horizontal checks the depth of the screen is again secured by horizontal rows of twill or twill and check.

At the near end, when all the wefts have been included in the braid, the plaiting is continued on as a free tail for about 6 inches and the end knotted. The tail is doubled obliquely along the under surface and passed through under two crossing wefts. (See Plate XII, *A*, 4.)

A general average for wall screens is 3 feet in width and 12 or 13 inches in depth.

The name *pola* appears in three of the sheets. In general it means a plaited coconut leaflet mat. When the word is used by itself, the *pola sisi* wall screen is usually meant. The wall screen is also called *pola taufafo* (to

the outside) as against *pola taufale* (in the house) which, though Pratt (23, p. 242) gives it as the inner *pola* of the house, was explained to me as the coconut leaflet floor mat also called *pola vai*. *Pola taufafo* also alludes to strangers or intruders, for when a wall screen breaks away, it falls to the outside of the house. My informants distinguished the roof sheet as *laupola* from *laupolapola* (a carrying sheet), also termed *polani*. When a plaited leaf is used as a canoe cover it is *polava'a*.

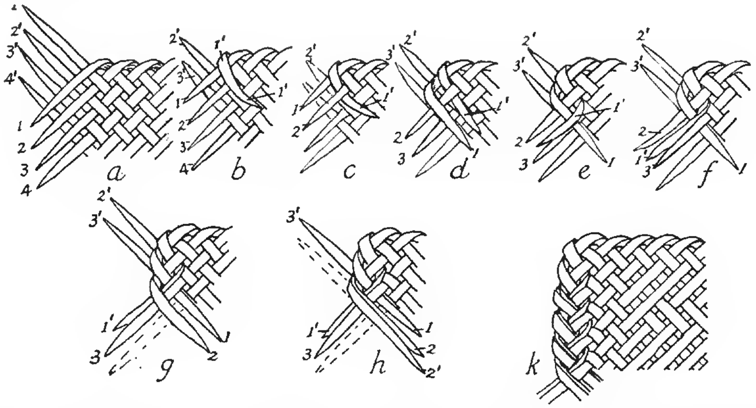


FIGURE 90.—Wall screen, finishing braid: *a*, in position, the sinistral wefts (1-4) incline towards the plaiter and dextral weft (1'-4') away from her. As in this position, dextral and sinistral are not obvious, the defts will be referred to as near (sinistral) and far (dextral) wefts. *b*, The top far weft (1') is doubled in over the first crossing weft (1) to form the first ply. *c*, The second near weft (2) is lifted up over both the second far weft (2') and the first ply (1') to form the second ply. *d*, The first far weft (1) is twisted in over the second ply (2) to form the third ply.

After the back ply of a pair is twisted over into the middle position, a near weft is added to it when it twists in from the right side of the braid and a far weft when it twists in from the left side. They are continued on in the braid plies. *e*, The ply formed by the weft (1') is the back ply of a pair and it is twisted over into the middle position from the right. *f*, The next near weft (3) is lifted up on the right side and added to the middle ply (1'). *g*, The back ply formed by weft (2) is twisted into the middle position from the left. *h*, The existing top far weft (2') is added to the middle ply from the left. The natural line of the far weft as it projects beyond the left of the braid is immaterial. It is simply seized and pulled around into position on the middle ply. *k*, General appearance from the plaiting side. The method now established is continued. There is no confusion so long as the near wefts are picked up in order from the right side of the braid from where it emerges from under the last crossing weft.

COCONUT LEAF FOOD PLATTERS

Platters for serving food consist of temporary articles quickly made for one meal and more carefully made platters for continued use. The temporary class contains two forms; the *mailo* and the *laulau*. The permanent class consists of one form termed *laulau* but distinguished from the temporary *laulau* by technique and use.

The mailo, also termed *ma'ilo,* consists of two forms; the unplaited, and the plaited. The unplaited *mailo* is quickly made by splitting off a strip of midrib carrying about 10 leaflets, separating the leaflets in the middle into two equal sets, pulling the leaflet ends together as two plies, and tying them in a reef knot. The under surface is turned upwards and forms a slightly concave triangular platter upon which food is placed. The plaited *mailo* (Pl. XII, *C,* 1) is made from two leaf strips from opposite sides, each bearing 6 or more leaflets which are plaited together with a check stroke. (See fig. 91.)

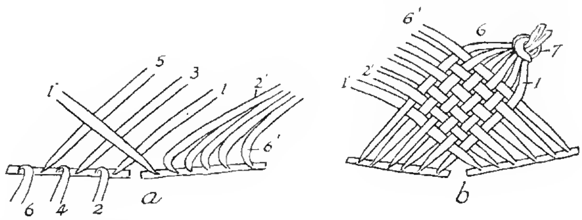


FIGURE 91.—Plaited *mailo* platters: *a,* With the under surface (*tua*) upwards, the strip bearing the dextrals is placed on the left with the two midrib strips practically in line. The three alternate dextrals (6, 4, and 2) are raised and the first leaflet from the right strip forming the first sinistral (1′) is laid over the recumbent dextrals (1, 3, and 5). The leaflets from the strip on the right form natural sinistrals. When the first sinistral is placed in position, the others are held out of the way in the right hand. *b,* The left hand as it drops the raised dextrals over the first sinistral picks up the three recumbent dextrals and forms the shed for the second sinistral (2′) which the right hand drops into position. With each movement, the left hand drops back one set of alternates and picks up the other and the right hand drops in the next sinistral until all six sinistrals have crossed the dextrals and have been plaited in. The dextrals projecting beyond the outside marginal sinistral (6′) are gathered up and tied with an overhand knot (7). The projecting sinistrals beyond the marginal dextral (6) on the left are similarly dealt with and the *mailo* is completed. See Plate XII, *C,* 1, where each strip carried six leaflets.

The leaflets throughout are kept open. The under surface of the leaflets being upwards, the platter has a slight concavity.

The temporary laulau (Pl. XII, *C,* 2.) is also plaited from two strips from opposite sides, each carrying 6 or more leaflets. It is commenced in a similar way to the plaited *mailo* but after the wefts have all crossed each other once, the plaiting is continued by bending in the leaflets to form side edges. (See fig. 92.)

Of the two forms of temporary plaited platters, the *mailo* is the much more important. It has come to assume an importance out of all proportion to its technique owing to custom having made it the correct platter upon which the *fa'ausi* preparation of grated *talo* must be served to high chiefs. Strict observance restricts the use of the *mailo* to those of the highest rank while chiefs of lesser status are served on breadfruit leaves alone. *Fa'ausi* is never served on the temporary *laulau* which, though better made and sometimes used

again, does not have the status of the simpler *mailo*. Here a cultural convention takes precedence over improved technique.

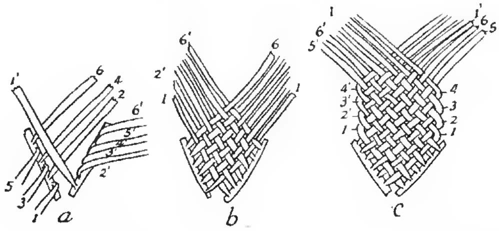


FIGURE 92.—Temporary *laulau* platters: *a*, The strips are placed at an angle which approximates the line of the leaflets from the opposite strip. The dextral leaflets of the left strip are divided into two sets of alternates and the first sinistral (1′) from the right strip laid in position. Again the other sinistrals on the right are kept out of the way in the right hand. The usual check technique is continued. *b*, All the sinistrals (1′-6′) have been crossed over the dextrals and the position arrived at in plaiting the *mailo*. Instead, however, of knotting the ends, the plaiting is continued. *c*, The plaiting is continued to make a longer platter by simply turning in the projecting weft ends as in plaiting the left and right ends of a roof sheet. Thus, on the left side, the lowest sinistral (1′) is bent in at right angles under the sinistral above it (2′) to comply with the check technique. It now functions as a dextral and passes under and over the other sinistrals to maintain the check. The next sinistral (2′) is similarly dealt with and (3′) and (4′) in turn. As this seems a convenient length for the platter, the sinistrals (5′ and 6′) are left as they are, but if greater length is desired, they may be turned in also. On the right side, the projecting dextrals are similarly dealt with. The lowest is (1) which has to be turned in *over* the dextral above it (2) to maintain the check. It now functions as a sinistral and is passed through the dextrals in check. This is followed in turn by the dextrals (2, 3, and 4), but they do not continue beyond the transverse line shown by the plaiting edge. The end is finished off by plaiting the leaflet ends into a three-ply braid commencing on the right and finishing on the left with an overhand knot (Plate XII, *C*, 2). The sinistrals run in the direction of the braid and are added from the inside while the dextrals are simply doubled over and added to the braid from the outside. A rougher finish may be made by knotting the two sets separately as in the *mailo*.

The permanent laulau (Pl. XII, *D*) marks an advance on the technique of the wall screen. As in the wall screen, the closed leaflets are used as wefts, but, whereas the screen wefts average about 0.8 inches in width, the platter wefts are reduced to half that width by splitting off the free edges of the leaflets. The reduction in width, which would make the plaiting too open, is corrected by using two strips instead of one to supply each set of wefts. The method of twisting the leaflets to keep the two midrib strips together to form one set of wefts is shown in figure 93.

The commencement is made by placing two double strips together with that bearing the sinistral wefts above the other as in the wall screen. The *fa'a'au* technique of running a horizontal row of dextral twilled twos across the sinistral wefts is exactly the same as in the wall screen. The craftswoman may please herself as to whether the first dextral shall pass over one, two, or

three sinistrals, for she can readily arrange the plaiting of the left edge to suit. The commencement, left edge, and body technique are all shown in figure 94. The right edge is turned in as in the screen sheet to comply with the pattern. The depth is reached when the ninth or tenth sinistral reaches the left edge. The plaiting edge is then defined by running a horizontal row of dextral checks across the full width.

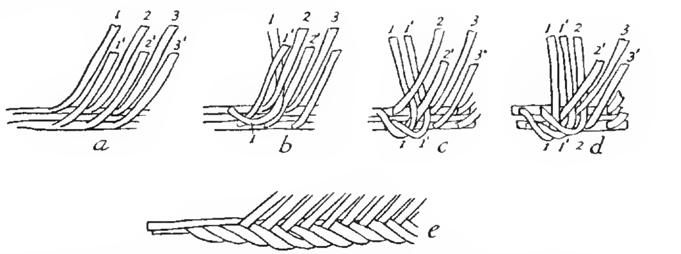


FIGURE 93.—Permanent food platter, combining two midrib strips. Two dextral bearing strips are placed together, referred to as the far and near strip. *a*, The strips are placed with the leaflets of the near strip (1,′ 2,′ and 3′) opposite the leaflet intervals of the far strip. *b*, Commencing on the left, the first leaflet (1) of the far strip is twisted over two leaflets on the right (1′ and 2), which means one from each strip. The leaflets twisted over are shown inclined to the left, where they are kept temporarily by the left middle finger. *c*, The first leaflet of the near strip (1′) is now twisted over the next two leaflets on the right (2 and 2′) again one from each strip. *d*, The next leaflet on the far strip (2) is twisted over two untwisted leaflets on the right (2′ and 3). The technique is now established. The leaflet on the left is taken alternately from each strip and twisted over two untwisted leaflets on its right, which will always be one from each strip. Thus the next movement will be the leaflet (2′) from the near strip over the two leaflets (3 and 3′). This is continued throughout to the right end of the strip. *e*, The finished appearance where the two strips are bound closely together and the dextral wefts of the near strip have filled in the gaps of the far strip. The two sinistral strips are treated in a similar manner except that the twisting commences on the right and the right leaflet from each strip is twisted alternately over two untwisted leaflets on the left.

The braid finish (*fili*). The far plaiting edge of the platter is finished off with a three-ply braid which differs in technique from that of the wall screen. Of the two sets of projecting dextrals and sinistrals, one set is braided on each surface of the platter. The set plaited on each surface is that which leans towards the plaiter, and the wefts are added to the middle ply of the braid from the right or plaited side. The back ply of the working pairs is always brought to the middle position by passing under the ply in front instead of over. To avoid confusion, the front ply of the working pair is always doubled back over its own course and the back ply brought into position with a half turn twist. On the right side, the additional weft from the plaiting edge is pulled up into position first before the back ply is twisted to the middle. This makes a further difference to the screen sheet braid in which the ply is twisted before the weft element. Another point of difference consists in dropping one element of the back ply when it enters the braid from the right. Braiding

commences on the far end of the under surface with the plaiting edge turned to the left. (See fig. 95.) The continuation of the braid on the other surface of the platter is shown in figure 96.

The permanent *laulau* is important in domestic economy. It is still in common, everyday use. All meals are served on plaited *laulau*. As they are effective and easy to make from material that is always available at no expense, they have rendered unnecessary the use of wooden vessels in the past and restricted the adoption of foreign crockery in the present.

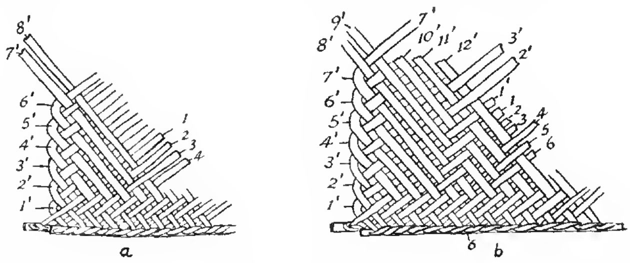


FIGURE 94.—Food platter (*laulau*) twill commencement technique: *a*, The first dextral (1) is raised and two sinistrals (1′ and 2′) passed under it. The second dextral (2) is raised, the third sinistral (3′) is passed under it, and the first dextral, which is still kept raised. The first dextral (1) is dropped, the second (2) is kept raised, and the next dextral (3) is picked up. Holding the dextrals (2 and 3) up, the next sinistral (4′) is passed under them and over the first dextral, which has been dropped. From here on the usual technique is carried on. The upper dextral of the pair is dropped, another dextral picked up from below and the next sinistral passed under them. The first projecting sinistral (1′) is turned in under the sinistral (2′) raised over (3′) and dropped. Working upwards, the next sinistral (2′) is turned in under the sinistral (3′) and raised while the sinistral (4′) is placed in position above the intervening dextral wefts (1 and 1′). The acting dextral (2′) is then dropped over (4′). The next projecting sinistral (3′) is passed under (4′), raised while the sinistral (5′) is placed above the intervening dextrals and then dropped over it. The next projecting sinistral (4′) is turned in under (5′), raised while the sinistral (6′) is placed in position and then dropped over it. Between the crosing dextral twill (4) of the commencement and the crossing dextral (4′), the sinistral (6′), forming the base of the plaited triangle, has crossed over six dextrals.

The craftswoman here decides that sinistral twilled sixes are as far as she will go. Before, therefore, the edge technique she has been following can be applied to the next sinistral (7′) she must do something or it will result in a twilled seven. This is obviated by raising the dextral (3) over it and then turning the projecting sinistral (5′) in from the left edge under the sinistral (6′) and over (7′). The pattern, which consists at this stage of a vertical line of dextral checks and a developing vertical line of sinistral sixes, is thus maintained. In the next movement dealing with the sinistral (8′), the lower part of its course is attended to by keeping the dextral (3) raised and raising also the dextral above it (2) and dropping them over (8′). The projecting sinistral (6′) is then turned in from the edge, passed under (7′) and raised over (8′), again maintaining the vertical ones and sixes. The vertical dextral checks and sinistral sixes are under control, but before building up further, the pattern to the right of the vertical sixes must be decided. The next two vertical panels are to be dextral twos and sinistral fours. *b*, Glancing at (*a*), the dextral (3) has already formed a twilled two. Before the next sinistral (9′) is moved, the dextral (3) must be dropped, (2) kept up and the one

above it (1) picked up. The sinistral (9′) is passed under (2 and 1) and at the upper end of its course, the dextral (6′) is dropped and the projecting sinistral (7′) turned in under (8′) and kept raised for (9′) to pass under it. The vertical line of dextral twilled twos can now be controlled and directed by dropping the lower one and picking another up above that retained in each movement.

The next element in the pattern, the sinistral fours, demands attention. To the right of the twilled twos, the sinistrals (7,′ 8,′ and 9′) have passed over one, two, and four dextrals respectively. The weft (9′) has established the beginning of the fours. Before the next sinistral (10′) can be placed in position, the lowest dextral of the four crossed (6) must be raised or else the sinistral (10) will form a twilled five. The dextral (6) is accordingly raised, (2) dropped, (1) kept up and the dextral above it (1′) raised, and the sinistral (10) placed in position. The upper ends are left for later treatment. The raising of the dextral (6) commences another vertical row of twilled dextral twos. For the sinistral (11′), the dextral (6) is kept up, the one above it (5) raised, the dextral (1) is dropped, (1′) kept up and (2′) picked up. For the next sinistral (12′) the dextral (6) is dropped, (5) kept up, the weft above it (4) picked up, (1′) dropped, (2′) kept up and (3′) picked up.

The sinistral has now commenced another vertical set of twilled sinistral fours. The technique already described is repeated and continued across the width of the plaiting.

The left edge is formed by bending in the projecting sinistrals successively under the sinistral above. Then as they function as dextrals they are raised for one stroke to let the next sinistral pass beneath. As we have seen, the left edge is built up with turned in sinistrals that have run their course between the horizontal line of dextral twos that formed the commencement twilled row and the left edge. Hence, each sinistral must be correctly worked into the pattern throughout its course before it can be turned at the left edge.

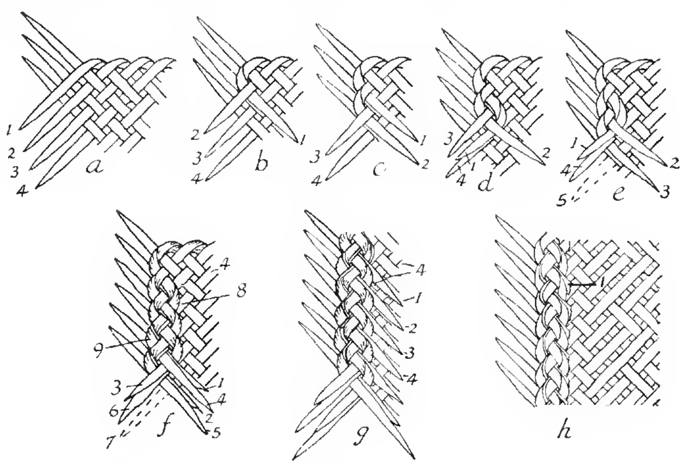


FIGURE 95.—*Laulau* food platter, braid finish (first course): *a*, In this position the sinistrals (1-4) are now directed towards the plaiter and as only one set is braided on this surface, they are the ones disposed of in order from the top. *b*, The second weft (2) is raised and the top weft (1) is twisted in under it from the left with the half turn twist which exposes its other surface. The raised weft (2) is then dropped over (1). *c*, The third weft (3) is raised, (2) is twisted in from the left and (3) dropped. The three plies (1, 2, and 3) are now established with the working pair (1 and 2) on the right. *d*, The front ply (2) is raised, the next weft (4) is pulled straight, the back ply (1) is twisted in from the right and (2) dropped over it. The weft (1) rests on the weft (4) which joins that ply. The back ply is now (3) on the left. *e*, The front

ply (1 and 4) is raised,, the back weft (3) twisted in and the front ply dropped over it. The technique is now established. The working pair is on the right. In the next movement, the back ply (2) will be twisted in under (3) and pick up the weft (5). *f,* By continuing the technique, the weft (3) has just picked up the weft (6) and each ply now contains two weft elements. The back ply of the working pair on the right contains the original weft (1) and the weft (4), which it picked up at the position marked (8). Here it was twisted in from the right (figure *e*) and lay on the new weft (4). At position (9) the ply was turned in from the left with a half turn, which brought the new weft (4) on top. As the ply has to turn in from the right in the next movement, and it contains two wefts, one of them has to be dropped. The top element (4), therefore, is twisted in to the middle, the under element (1) is left where it is and the next weft (7) picked up. Note that the half turn on the left places the shorter element underneath, which is the appropriate one to discard at the next turn on the right. *g,* The technique of dropping the shorter element on the right is shown. They drop out in the order in which they entered the braid. The course traveled by each weft in the braid is shown by (4). The technique keeps the braid thin, as no ply contains more than two wefts. The twist on the right drops a weft and picks up a new one, thus maintaining a pair throughout in each ply. *h,* After the braid is completed the discarded weft ends on the right are cut off short. The cut-off end of (1) is shown a little longer than in actual technique. They are cut off close under the twist and cannot be seen unless the twist part of the upper element is raised.

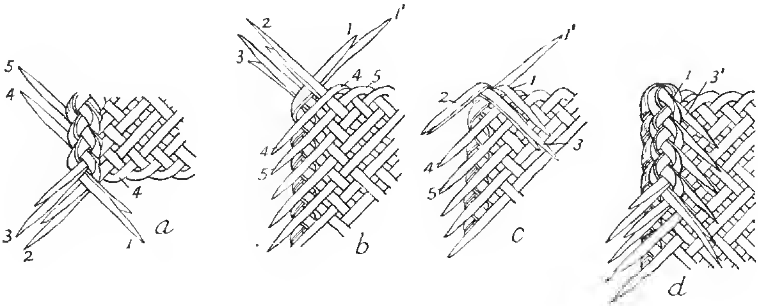


FIGURE 96.—*Laulau* food platter, braid finish (second course): *a,* The braid with its three plies is shown at the bottom or near end of the plaiting edge, with a couple of dextrals (4 and 5) running in the direction away from the plaiter; *b,* the platter is turned over to expose the true upper surface. The braid ends are now at the far end of the plaiting edge and the dextrals left over from the first course are now directed towards the plaiter. Before doubling over the plies of the braid, the back ply (3) is twisted in over (2) to bring the working pair on the plaited side. *c,* Each ply is doubled over with a half turn. Thus ply (1) is now the back ply of the working pair. The under weft element (1') is therefore discarded and the under element (1) is ready to be twisted in from the right under the front ply (3) when it will pick up the new weft (4). *d,* The technique is exactly the same as on the other side. The discarded weft (1') has been cut off to avoid confusing the figure while the other discards commencing with (3') are shown on the right. The edge of the braid on the other side projects slightly beyond the edge of the new braid. The braiding is continued to the near edge when all the wefts are incorporated in the braid. The last wefts are continued on as a free braid tail, which is knotted, doubled over on to the under surface and kept there by passing the knot under a couple of crossing wefts. (See Plate XII, *D,* 2.)

The ends of the midrib strip forming the commencement are also doubled in on the under surface and passed under some crossing wefts.

BASKETS

The baskets made of coconut leaves that are in common use may be divided into two main classes: the *'ato,* and the *'ola.* In addition there are some smaller types and a large round basket the origin of which is uncertain. A satchel is also made from pandanus leaf and a rare type of basket from coconut fibre. Round baskets made by coiled weaving are extensively made but the technique has been introduced.

COMMON TYPES

The *'ato* baskets are those in common everyday use for transporting and holding cooked and uncooked food. They are made from a single strip of coconut leaf midrib carrying leaflets running in one direction. The crossing elements have therefore to be provided by bending the alternate leaflets in the opposite direction. The open leaflet and the check technique is used. The midrib strip forms the rim of the basket and the bottom is closed by a three-ply braid. The manner in which the three-ply braid is plaited results in two varieties of *'ato* named according to the braid technique; *'ato fili tasi,* or *'ato fili tolu.* (See Plate XII, *B,* 1 and 2.)

1. In the *'ato fili tasi* a midrib strip twice the length of the required basket is torn off the side of a leaf, not too near the tip or the base in order to obtain even leaflets. If only one basket is to be made, the plaiter selects the left side of the leaf, as it will have natural dextrals and the plaiting will proceed from left to right. With a right strip, the natural sinistrals are plaited from right to left as in the roof sheets.

On a left sheet, the bending of sinistrals and the check plait are exactly the same as in the roof sheet; the only difference is that the leaf midrib is pared down more so that it is pliable and may readily be bent around to form the circumference of the rim. The technique of leaving the first leaflet on the left out of the first pair is also observed here. Thus, the third leaflet forms the first sinistral to be turned back and from there on the right element of each succeeding pair is turned back as a sinistral over the first element of the pair which remains in its natural position as a dextral.

When the required depth, which is greater than in the roof sheet, is obtained, the dextrals are successively bent downwards at right angles to rest on the sinistral which has been laid in the shed formed at the working edge. Each dextral is then crossed by the top working dextral as in the technique of the carrying sheet. (See fig. 81.) The reason in each case is to clear the way for the braid join. On reaching the right end of the strip the odd leaflet is left after the last pair and the midrib strip is cut off beyond it.

The two ends of the midrib strip are brought together to form the *so'o*

join and the open space between the ends is filled in at the same time. (See fig. 97.)

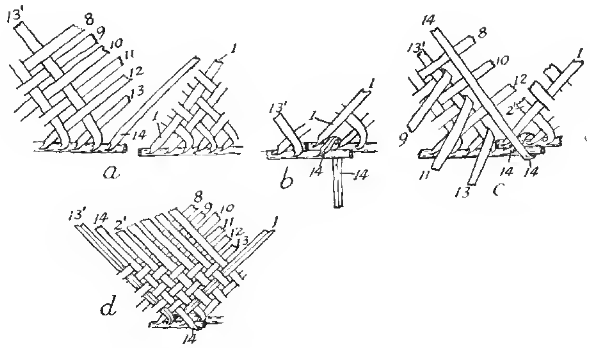


FIGURE 97.—Basket (*'ato fili tasi*) plait and join: *a,* What was originally the left end is now on the right. The odd first dextral (1) on the original left has its pair made up by the odd leaflet (14) on the end of the strip on the left. This odd leaflet forms the binding element of the join. *b,* The strip end on the right is placed behind the other to overlap slightly so that the projecting free sinistrals on the left are parallel with the plaited sinistrals on the right. The odd leaflet (14) is pushed through the interspace on the right of the first dextral (1) and over its midrib strip. It is then drawn tightly down to draw out the slack. Its subsequent course is part of the next process of filling in the end. The marginal sinistral (13′) on the left and the marginal dextral (1) on the right form the boundaries of the plaited part. Between them is a v-shaped part occupied by the free ends of the projecting dextrals from the left and the sinistrals from the right. This gap has to be filled in by plaiting the free crossing wefts. *c,* The six dextrals on the left form the working dextrals. To comply with the check technique, the wefts (9, 11, and 13) are raised to form a shed. The binding leaflet (14) is pulled firmly to keep the midrib ends together, brought up around the near strip and then laid in the shed as a sinistral weft. This closes in the gap shown in (*a*). *d,* The raised dextrals are straightened out over the sinistral (14) and the alternates raised to form a shed for the next sinistral, which is (2′). The check plait is continued to work in the remaining free sinistrals but with each movement the top free working dextral is turned forward to rest on the sinistral in next shed, as was done in the main plaiting. In this way the gap is filled in and the plaiting forms a collar of even depth. (See Plate XIII, *B*.)

Closing the bottom. The edge of the closed plaiting formed by the midrib strip margin remains unchanged as the upper rim of the basket so the other edge at which the plaiting ceased must be closed to form the bottom of the basket. From the plaiting edge, the free ends of the sinistrals project upwards and the ends of the dextrals are tucked down out of the way. The closing commences usually above the *so'o* join of the rim so the basket is rested on its rim and turned until the *so'o* join marked by the crossing of the leaflet round the rim, is away from the plaiter. (See Plate XIII, *C*.) The basket takes its name from *fili* (to braid) and *tasi* (one). The free ends of the wefts are plaited into one line of three-ply braid which, however, is done in two courses in the same way as the join of the carrying sheet. The first

course, commencing above the *so'o* join, works towards the plaiter. See fig. 98.)

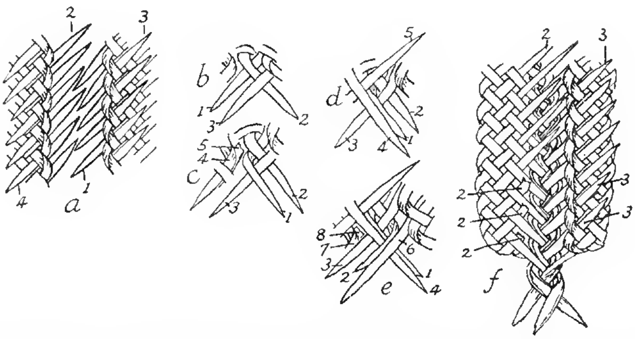


FIGURE 98.—Basket (*'ato fili tasi*), closing bottom (first course). (See Pl. XIII, *C*.) *a*, With the continuous plaiting edge approximated into a right and left side, the direction of the weft ends differ. On the right side, the free sinistral wefts (1) project towards the worker while the tucked down dextrals (3), even if pulled out, are directed away from her. On the left, the free sinistrals (2) are directed away from and the tucked down dextrals (4) towards the plaiter. The position here is slightly different to that in the carrying sheet owing to the two sides being formed from different sides of the leaf and the free projecting wefts being both directed towards the worker. In the first course of the braid, the free wefts on the right can be utilized, but on the left the tucked-down wefts must be pulled up, as required to cross with the elements from the right. *b*, Commencing at the far end of the approximated sides, the end free weft on the right (1) is pulled across the middle line in its natural direction. An end turned-down weft on the right (2) is crossed over it and then the second free weft from the right (3) is crossed over (2). These three wefts provide the three commencing plies of the braid and of these (1) is the back element of the working pair. *c*, The back ply (1) is twisted over (3) to the middle position from the left. The next turned weft (4) is shown resting on the free weft (5), which has been cut off in the figure for clearness. *d*, Before the turned-down weft (4) is pulled up, the free weft (5) on which it lies is pulled across the work in its natural direction. The turned-down weft (4) is then pulled up from under the crossing weft which keeps it down. It is straightened out across the free weft (5) as is natural with the check technique and laid down over the middle ply (1), with whose direction it naturally coincides. *e*, The back ply of the working pair (2) is now twisted over the front ply (1, 4) to the middle position. The next free weft from the right (6) is then added to the middle ply (2). The technique is now established. In the next movement, the back ply (3) will be twisted over the ply in front (2, 6) to the middle position. Before the next turned-down weft (7) is added to the middle ply from the left, the free weft (8) (cut off in figure) will be pulled up across the braid, then (7) pulled up, crossed over (8) and laid over the middle ply. *f*, The appearance of the first course is here evident. The free wefts from the left (2) which cannot be used have each in turn been pulled across the braid. They merely continue the check and are not incorporated in the braid. They project across the middle line of the braid but, as their direction carries them clear to the back of the working plies, they do not confuse the work. The lowest three (numbered 2) are cut off in the figure to show up the braid. On the right, the turned-down wefts (3) are shown still tucked down out of the way.

The braid having reached the near end, the plies are plaited on for an extra turn to project as a free tail. The ends of the basket are reversed, the

free tail doubled over, and the second course also plaited towards the worker. (See fig. 99.)

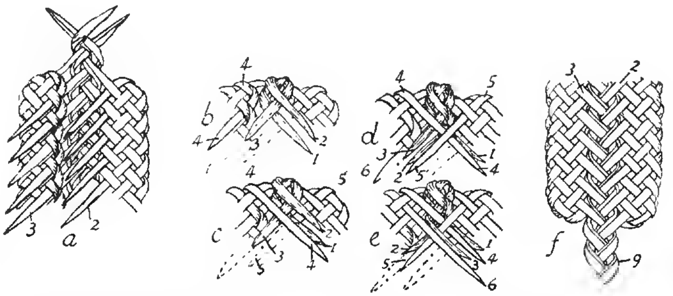


FIGURE 99.—Basket (*'ato fili tasi*) closing bottom (second course; see Pl. XIII, *D*), *a,* With the basket reversed, the direction of the remaining two sets of wefts are also reversed. The free wefts which come in from the left and were pulled across the braid away from the worker are now on the right (2) and directed toward her. The turn-down wefts that were on the right are now on the left (3) and when pulled out will cross the other set toward the worker. *b,* The free tail is doubled over towards the worker. In this position the first turned-down weft on the left (4) is in the line of the middle ply (1). *c,* Though, owing to the doubling over of the braid, the middle ply (1) lies under (3) instead of over it, it does not matter for one or two turns. The turned-down weft (4) is pulled up from under its crossing weft and laid over the middle ply (1). *d,* The back ply (2) of the working pair is now twisted forward to the middle position. Owing again to the reversal of the free tail, it is better for (2) to pass *under* the front ply (1, 4) for this stroke. The first free weft from the right (5) is then laid on the middle ply (2).

The free elements from the right project across the middle line and from their downward direction, they now lie, when required, under the working plies of the braid. They have therefore to be picked up on the right side of the braid, pulled up from under it and then laid on the middle ply that twists into position from the right. *e,* The back ply (3) is twisted forward from the left over the front ply (2, 5) into the middle position. The next turned-down weft on the left (6) is pulled free and laid on the middle ply (3). *f,* The established technique continues with the free wefts from the right (2) and the turned-down wefts from the left (3) alternately joining the middle ply as it twists into position from their respective sides. All twists to the middle position are *over* the ply in front except in the two turns at the beginning. When the second course of braiding reaches the near end and has incorporated all the weft ends, the braiding is continued as a free tail (9) for the remaining length of the material.

It is finished off with an overhand knot, which is pushed through the plaiting to the inside of the basket.

Though exact wefts have been figured at the doubling over of the braid to commence the second course, the plaiter uses her judgment as to what wefts fit in with the direction of the plies. Mathematical accuracy is not attempted in practice and is not necessary.

In a basket plaited from a right hand leaf strip, the sinistrals are turned down and the dextrals project free above the plaiting edge. Though the directions are opposite to those described, it need not confuse the closing of the bottom, if the principles described above are observed. Hence, after ap-

proximating the continuous plaiting edge into two sides, for the first course, the set from either side that is directed towards the worker is selected. One will be free and the other tucked down, but it does not matter which side they

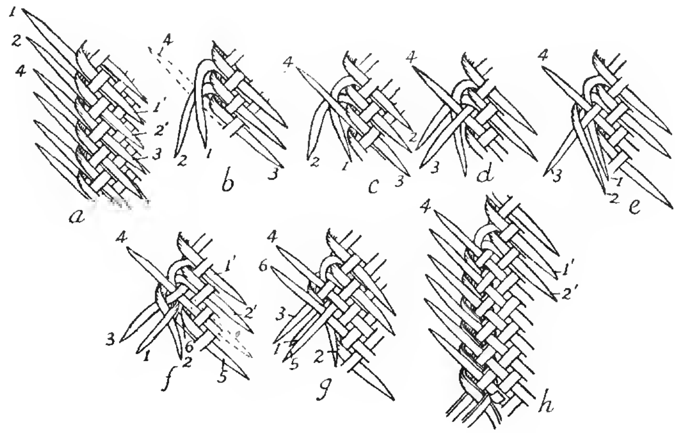


FIGURE 100.—Basket (*'ato fili tolu*) closing bottom (first course): *a*, A section of the plaiting edge shows the free dextrals inclined away from the plaiter while the turned-down sinistrals are toward her even when freed from under the crossing wefts. Following the principle already established, the wefts inclined towards the worker will be used in the first course of braiding. In order, however, to start the braiding, two free wefts (1 and 2) are used for the first two plies before the first turned-down weft (3) comes into the combination. *b*, The first free weft (1) at the point selected for commencing is crossed *over* the next free weft on the right (2). They are pulled down out of the natural direction of their course. The first turned-down weft (3) to form the third ply is the one which emerges from under the second free weft (2) and which is tucked down along the course of the next free weft (4). *c*, Before the turned-down weft (3) is lifted, the free weft on which it lies (4) is picked up and lifted *over* the first two plies formed by (1 and 2). Its natural direction throws it back behind the working part of the plies. *d*, The turned-down weft (3) is lifted and straightened out over the free weft (4) to continue the check technique and then crossed over the first ply (1) to form the third ply in the middle position. The three plies (1, 2, and 3) are now established. All subsequent additions to the braid come from the plaiting or right side. They are taken from the turned-down wefts in order and are added to the middle ply after the back weft of the working pair has been twisted into the middle position from the right. Before a turned-down weft is added, the free dextral on which its turned-down part rests must be pulled up over the braid above and to the back of the working plies. *e*, The back ply (2) is now twisted in from the left over (3) to the middle position. No elements are added to the middle ply when it twists in from the left free edge. *f*, The back ply (1) is twisted over the ply (2) to the middle position. As it came in from the right the next turned-down weft to be added to it is (5), which rests on (6). *g*, Before the turned-down weft (5) is added to the middle ply (1), the free weft (6) on which it lies is pulled over the braid. The weft (5) is then straightened out to cross over (6) and is added to the middle ply (1). *h*, The established technique is continued with the appearance shown. The plaiting edge is moved around as the braid continues right around the plaiting margin until it arrives back at the commencement point. The relative position of the free wefts and the turned-down weft remains the same throughout.

come from respectively. Similarly on turning the braid for the second course, the remaining sets will both be directed towards the worker. In the first course, the free wefts will be from the left and the turned down ones from the right.

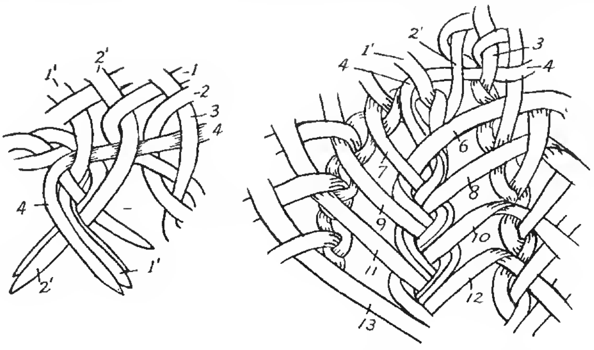


FIGURE 101.—Basket (*'ato fili tolu*) closing bottom (second course): *a,* The braiding of the first course is completed when the last turned-down wefts (1' and 2') are respectively added to the middle ply from the right. After the last one (2') is added to the middle ply, the back ply with (1') is twisted in from the left to the middle position. The first free weft (4) which passed over the commencement of the braid is now to the right. It is passed *under* the last two wefts added to the braid (1' and 2') and then brought up over the braid to enter the middle ply (1') from the left. The weft (4) thus binds the commencement and finish of the marginal braid together and is termed the *so'o* (join). The mesial braid commences with the twist next to the join. Taking this as the far point, the braid is plaited down the mesial line towards the worker by adding the free wefts alternately from either side to the ply that has been twisted into the middle position from the respective sides. In this position, the projecting free wefts which were all dextrals, incline toward the plaiter on the left but away from her on the right. The difference in direction on the right makes no difference to technique, but they are simply bent back with or without a half turn to take their place in the braid. *b,* As the last addition was the joining weft from the left, the back ply is twisted into the middle position from the right and the next free weft on the right (6) added to the ply. Then follows a twist on the left and the addition of the first free weft on the left (7). As the braiding proceeds down the mesial line, the alternate wefts from either side (8-13) are slightly lengthened before inclusion in the braid. Past the middle of the course, they are gradually shortened again so that the elliptical marginal braid is not closed in too much at the sides. In this way a somewhat rounded bottom is given to the basket, which contrasts with the single braid basket. When all the free wefts have been used up, the braid is continued on as a free tail, knotted at the end and thrust through the bottom of the basket to the inside. (See Plate XIII, *E* and *F*.)

2. The *'ato fili tolu,* differs merely in the method of closing the bottom. Of the two sets of free weft ends at the plaiting edge, one set is used to form a marginal three-ply braid round the plaiting edge. This forms a circular opening which, however, owing to the tightening up of the plies, is very much smaller than the rim opening. When the first course of marginal braiding reaches the commencement point, the other set of free wefts are added to the three ply braid from either side in such a way as to bring the braid down the mesial line. Owing to the pulling in of the wefts of the second

course, the marginal circle becomes altered to a long ellipse. Looking at the bottom from within, the braided sides of the ellipse with the mesial line of braid gives the appearance of three braids. Hence, the name of the technique applied to the basket, *fili tolu* (three braids).

The type described (fig. 100) was made from a right hand leaf, not from preference, but because the left hand leaf strip had been used to make the previous type. It is described here in preference to the normal left hand strip to demonstrate the adaptability of the technique. The first course commenced above the *so'o* join at the rim.

The *so'o* join. Reference back to figure 100 *f* shows that the turned down weft 3 was the first used in the braid. The dotted course shows the position it previously occupied. Above it are the turned down wefts (1′) and (2′) which are turned down on the course of the two free wefts (1) and (2) which form the first two plies of the braid. Also the free weft (4) is the first of the series of free wefts that were pulled out over the braid. (See figure 101.)

The *'ato* baskets are made of green leaves and discarded when dry, as they become brittle and weak. The green basket is termed *'ato mata* (*mata*, green) and the old dry basket, *'ato 'ato*. The single braid basket is termed *'ato fili tasi* from its technique and *'ato fu'e umu* from its important use as a receptacle for the cooked food after the oven is opened (*fu'e umu*). The elliptical bottomed basket is *'ato fili tolu* from its technique and *'ato 'ave 'avenga* from its principle use in carrying burdens (*'avenga*) from the cultivations. It is also termed *'ato toli 'ulu* from its particular use in carrying breadfruit (*toli*, to pluck, and *'ulu*, breadfruit). The technique of the bottom is said to have been introduced into Samoa from Niue and the basket gets the additional name of *'ato fa'aniue* (made after the Niue style). The *'ato* baskets are also termed *'ete* [Cf. Maori, *kete*] but *'ato* is in more common use.

FISHING BASKETS

The *'ato* types of baskets have fairly wide interstices between the wefts which become wider as the material dries. For fishing purposes, closer wefts and a more permanent use required a different technique. Such baskets (*ola*) were in Savaii divided into three classes: *ola malu*, *ola tu*, and *si'u ola*.

1. The *ola malu* of Savaii are small deep baskets used by women to carry small fish and shell fish collected in the lagoon. A strip of *fau* bast is run through between the wefts close under the rim of one side and the ends are tied round the waist. Both hands are thus freed. Three varieties range from 8 to 12 inches wide at the rim to 10 to 12 inches in depth. Leaflet-bearing midrib strips are used and the plaiting stroke is the check. The midrib strip ranging from 16 to 24 inches in length is split off as thin as possible. The

upper part of the lateral surface of the strip is carefully split off so that it carries with it, the attachments of the leaflet midribs. As it is torn off, it carrics the lcaflet midribs with it and leaves each leaflet split into two and attached close together to what is to form the rim strip. The lower edge of the rim strip is also trimmed and the lowcr free natural edges of the leaflets are removed. In the neater basket (Plate XIV, *A*, 1), the two wefts thus provided by each leaflet are 0.4 inches wide. In the larger,, coarser basket (Plate XIV *A*, 2.) the wefts are 0.6 inches wide. By using two midrib strips a closer plait and a narrower weft is made possible. The baskets figurcd have each a different method of commencement at the midrib strip.

The larger *ola malu* from the south coast of Savaii have only one midrib strip which is from the left side of the leaf, thus forming natural dextrals. (See fig. 102 and Pl. XIV, *A*, 2.)

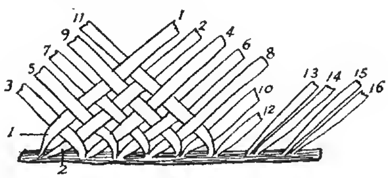


FIGURE 102.—Basket (*ola malu*), commencement: *a*, The left element of each leaflet pair (numbered odd) is turned to the left to function as sinistrals and the right elements (numbered even) continue in their natural direction as dextrals. Each sinistral as it turns to the left makes its first chcck stroke *over* the dextral on the left. The exception is the first weft on the left (1) which, having nothing to cross over, is turned to the right over the next sinistral (3) and functions as the top dextral.

The usual check technique is carried out. When the plaiting reaches the right end of the midrib strip, no special technique is used for binding the two ends together as in the *'ato*. The last element on the right end of the strip is naturaly the right elemcnt of a pair and, being a dextral, will be kept down. The lowest sinistral (3) will naturally pass above it and thus lie in the prcpared dextral shed in its natural order. The space betwecn the two ends is thus automatically filled in without any complications.

With the use of one midrib strip, the leaflet wefts are left as wide as possible to narrow the interspaccs between the wefts but they are not completely closed. Very little of the leaflet midrib was removed so that the half leaficts are close together at the upper points of attachment on the midrib strip.

In the next variety a closer plait is obtained by using two midrib strips and a narrower weft is thus possible.

In the basket (Pl. XIV, *A*, 1) from the north coast of Savaii two midrib strips each supply a different set of naturally dirccted wefts. (See fig. 103.)

A third *ola malu* has also two midrib strips with narrower wefts. It commences in the same way as the form shown in Plate XIV, *A*, 1, but half way along the strip a change in arrangement takes place as shown in figure 104.

The depth of the basket body is in marked contrast to the width. It forms a deep bag more suitable for holding objects when the carricr is continua' stooping down and groping amongst the stones. Depth is secured by adding

working sections to the commencing section in the usual way. The additional working sections naturally differ from those in sheets by having no end edges to turn in. The new working section is built up with an oblique edge formed by a dextral on the left. When the section comes round to the starting point the open triangular part is filled in exactly as the ends are closed at the commencement. In the *'ato* type, owing to the wide wefts, the depth of the basket was secured by the first working section.

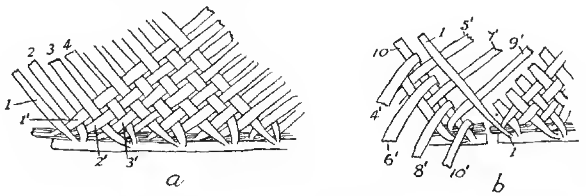


FIGURE 103.—Basket (*ola malu*) commencement: *a*, The sinistral wefts are placed over the dextral and its strip is nearer to the plaiter. The first sinistral (1) is left free and the first dextral (1′) is raised. The second sinistral (2) passes under the dextral (1′) which is dropped and the next dextral (2′) picked up. The next sinistral (3) thus passes under (2′) and over (1′). The dropped dextral (1′) is picked up, the raised dextral (2′) dropped and the next dextral (3′) picked up. The next sinistral (4) is placed in the shed. The picking up of alternate dextrals and placing the next sinistral in the shed provided carries on until a working edge is provided. The working edge is then continued on to the right end of the strip. *b*, The right end is brought around and is thus on the left in the figure. The last sinistral (10) has passed under the second last dextral (9′). The last dextral (10′) is raised with the alternate series of dextrals (8,′ 6,′ 4′) while (9′) and the other alternates (7,′ 5′) are left down. Into this shed, the first sinistral (1) from the commencing end of the strip fits naturally and the end is closed automatically by the usual technique.

The bottom is closed by a double braid as in the *'ato,* but, instead of doubling over the end of the first braid course, it is continued on in a free tail.

The ends of the baskets are reversed and the second set of free wefts commenced as a fresh braid. The technique after the three initial plies have been established is exactly the same as in the second course of the *'ato* braid. At the near end, the braid is continued as a free tail.

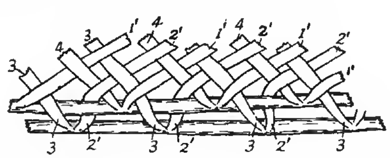


FIGURE 104.—Basket (*ola malu*) commencement: The two wefts from each leaflet instead of following the same direction are diverged in opposite directions. The dextrals (1′) still make their first stroke over the sinistrals but the diverged dextrals (2′) from the lower strip pass behind the upper (dextral) strip before it passes over a sinistral. The original sinistrals (3) from the lower strip and the diverged ones (4) from the upper strip are shown.

These baskets have thus a free tail at each end of the bottom. The braided tails are made extra long. In the smaller form, they are longer than half the depth of the basket. They are turned up along the outside of the ends for a few inches, pushed through to the inside, then brought outside again and the knotted ends are left on the outside. In the larger basket the tails are not so long and the knotted ends, after a short course outside, are pushed through to the inside. (See Plate XIV, *A*.)

2. The *ola tu* are large leaflet baskets made with two midrib strips from opposite sides of the leaf to supply natural crossing wefts. The plaiting stroke is a twilled-two changing towards the bottom to lines of check. The sinistral bearing strip is placed above the other and the closed leaflets are used. The free edges of the leaflets are trimmd, but the leaflet midribs are left intact. The baskets are thus stronger and stiffer than the *malu* type which, owing to the removal of the leaflet midribs, are soft and pliable.

The *fa'a'au* commencement by horizontal twilled twos is exactly the same as in the wall screens. The first dextral on the left is, however, lifted after the first sinstral. This results in marked differences of appearance in the plait along the rim. Where the two midrib strips have worked a little distance apart, the transverse row of sinistrals is deep and marked. Where the midrib strips are close together only the attachments of the sinistrals to the outer strip can be seen and the dextral horizontal row appears prominent near the rim. The appearance of a change of technique is given but it is not so. (See two ends of the rim in Plate XIV, *B*.)

As in the *ola malu* no special weft join is used when the ends of the strip are brought together. Any long ends that may be left on the midrib strip are turned up with the wefts and plaited in.

The horizontal twilled twos are continued but here and there twilled threes have been introduced to level the line of plaiting which has been affected by a curve in the rim. Narrow strips are also torn from the free edges of the wefts to narrow the wefts and thus narrow the basket towards the bottom. Thus wefts which are 0.8 inches wide are 0.6 inches towards the bottom. Within 6 inches of the bottom, the twilled twos give place to check.

The bottom is closed with the two-course, three-ply braid each ending in a free tail as in the *ola malu*. The knotted tails are pushed through to the inside close to their origin at the bottom and after a course inside, the knotted ends are pushed through to the outside.

The *ola tu* is used by women to catch fish which are driven out of the heaps of stones in the lagoon that have been erected to attract them as resting places. These baskets have been termed *fanga i'a* (fish trap) which, however, is a functional and not a generic name. They must not be confounded with the true *fanga i'a* trap made of vines with a single-pair twine.

3. The *si'u ola* forms a receptacle for the catch of fish either on the canoe or after it is brought in to shore. Like the *ola tu*, it is a twilled basket made with the closed leaflet wefts and finished at the bottom with a two-course braid, each braid with its own tail and knot. The crossing wefts are also supplied by two midrib strips from opposite sides of the leaf. The basket, however, is much smaller and the strip receives special treatment.

The strip from the left side of the leaf has each leaflet twisted forward in its natural direction over the leaflet in front of it. (See figure 105.)

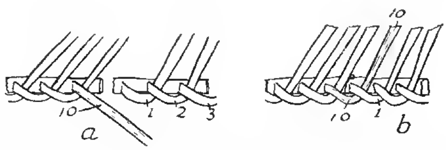


FIGURE 105.—Basket (*si'u ola*) rim twist and join (*so'o*): *a*, The leaflet towards the butt end (1) is twisted over 2, then 2 over 3, and so on throughout the strip. This resembles the twisting technique followed in the *laulau* platter but is simpler, being confined to one leaflet strip whereas in the platter a pair of strips were treated together. The other strip supplying the sinistrals is similarly treated.

The two double strips are then placed in position for plaiting with the midrib strip towards the worker and the sinistral bearing strip uppermost. The *fa'a'au* commencement by horizontal twilled twos is the same as in the wall screen but the first dextral is raised beyond the first sinistral and kept raised until the second and third sinistrals have passed under it to establish the twill. The two midrib strips are kept close together throughout and the *si'u ola* has thus a neat twisted rim in which the midrib strip cannot be seen from the outside. This contrasts with the rougher rim of the *ola tu*. In Tutuila, the dextral wefts were more commonly supplied by one strip without the leaflets twisted. In twisting the leaflets, the first leaflet twisted over that in front of it has no leaflet passing under the arch that it forms. Also the last leaflet has no leaflet left over which it may be twisted. When the ends of the midrib strip are brought together, the first empty arch is shown by (1) and the last leaflet by (10) *b*, The last leaflet (10) is then simply passed under the arched first leaflet (1), drawn taut, and the join is completed. The outer sinistral strip is similarly treated. The filling in of the end gap between the marginal wefts is then carried out for the join is not made until the working edge has reached the end of the strips.

In the *si'u ola* figured (Plate XIV, *C*) the slight narrowing at the bottom is due to the natural narrowing of the wefts and not to special paring of the wefts as in the *ola tu*.

After establishing the horizontal twilled-two commencement, the twilled twos are worked in vertical rows on the body and end in check at the plaiting edge. The bottom closing technique is identical with the *ola tu* but the two knotted tails were pushed through to the inside and left there. One tail in the *ola* has been pushed through so close to its origin that it is not obvious from the outside and at first gives the impression of the doubled-over technique of the *'ato* ending in one tail.

In Aunuu Island, a type of *ola* is made with the outer sinistral leaflets twisted on the strip whilst the inner dextral leaflets were added untwisted.

The leaves were first cut into five or six inch sections and laid out to dry. The left, or dextral bearing strips, when twisted were joined as in figure 105, to get the length but the dextral short strips were added on the under side as required by the plaiting. The rest of the technique was as above but the knotted tails, after being pushed through to the inside, had the knots pushed out again. These baskets were 12 inches deep, 18 inches wide at the rim and narrowed to 11 inches at the bottom. They were called *o'la malu* but differ considerably from the *ola malu* of Savaii.

CHIEF'S BASKET

The best twilled basket seen was given to Bishop Museum by Tuitele of Leone (Plate XIV, *C*, 3). Both the dextrals and sinistrals were supplied by two midrib strips treated by the double twisting method described with the *laulau* platters. (See fig. 93.) Closed leaflet wefts were used and after the orthodox horizontal twilled twos of the *fa'a'au* commencement, sinistral threes and dextral twos were used and then vertical rows of twill ending in horizontal rows of twill.

The closing of the bottom presents a new ornamental motive. The first course is braided in the usual way, finished off with a free tail, and knotted. In the second or outer course, plaited with the remaining free weft ends on either side, a five-weft plaited strip is made instead of the usual three-ply braid. The wefts, which started off with a width of 0.4 inches, by the time they reach the full depth of the basket are 0.3 inches in width, and it is thus possible to make a neat braid with the narrower material for the turns and twists. The five-ply braid is shown in detail in figure 106.

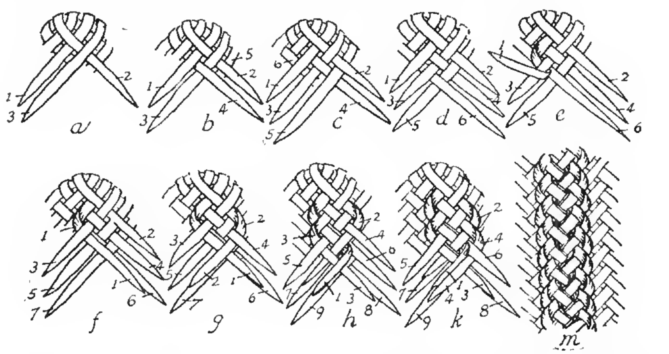


FIGURE 106.—Basket (*'ato'afa*), five-ply bottom finish: *a*, the orthodox commencement of a three-ply is made by crossing (2) over (1) and (3) over (2). *b*, Instead of twisting the back ply (1) over (3) and picking up the next free weft from the left to add to the middle ply, as in three-ply braiding, the back ply (1) is left for the time being and the free weft on the left (4) is crossed over (3) to form a fourth ply. *c*, The back ply (2) on the right is left as it is and the next free weft on the right (5) is picked up from under (2) and crossed over (4) to the middle position thus forming five plies with

three on the left. *d,* From now on each movement to the middle position is commenced by the next free weft on the side to which the three plies are directed. The next free weft on the left (6) is therefore picked up from beneath (3) and crossed to the middle position over (5). *e,* The movement is now completed by adding the back ply (1) of the same side to the middle ply position. To comply with the check technique, it is twisted with half turn inwards under the ply in front of it (3) and joins (6) in the middle position. *f,* The next free weft from the right (7) must now cross to the middle position. Instead, however, of crossing both elements of the last ply (1 and 6), the upper element (1) is raised and 7 thus passes *over* the last new element (6) and under the old one (1). *g,* The movement must again be completed by twisting the back ply on the same side (2) with a half turn under the ply in front (4) and adding it to the middle position occupied by (7). In joining (7) it passes over the weft (1). The technique is now established on general lines. *h,* The next movement comes from the left, where the next free weft (8) is picked up from under the middle ply of that side (5) and crossed to the middle position over the last ply (7 and 2). It is then joined by the back weft (3) making a half turn under the ply in front (5). The next movement is commenced by picking up the next free weft on the right (9) from under the middle ply of that side (6 and 1) and passing it over the lower element (8) and under the upper element (3) of the last ply used as was done in the similar previous movement from that side by the weft (7).

Complications have now occurred through the presence of the extra element formed by the weft (1). The orthodox movement already established is to twist the back weft (4) under the ply in front (6 and 1) on its way to join 9 in the middle position. Before completing the orthodox movement, the extra element is twisted over with a half turn to join (9) in the middle position. *k,* The movement from the right is then completed by twisting the back weft (4) under the weft (6) in front and adding it to the middle ply where it rests on (9 and 1). The middle ply thus contains three elements of which the undermost one is the last new weft added (9). *m,* The next movement from the left in imagination is commenced by lifting up the next free weft (10) from under the middle ply on that side (7 and 2) and crossing it over the last ply used (1, 4, and 9) to the middle position. The middle ply on the left has two elements (7 and 2). The upper of these (2) is twisted over directly into the middle position with (10) thus leaving the newer element (7) to form the outer twisting element for a later movement. The back weft (5) is then twisted under the weft (7) in front of it and joins the middle ply.

The middle ply formed by such a movement contains three elements (10, 5, and 2) of which the undermost is the last added free weft 10. When the next movement from the right is made, the new free weft (11) will pass over the undermost element (10) and the other elements of the new ply over the other elements of the last ply (5 and 2).

The complete technique of the five-weft plait can now be understood. In each movement to establish the now composite plies in the middle position, the new weft element is always placed first. It is thus at the bottom of the ply and is left out for onc movement to furnish the outer twisted margin of the braid. The upper elements of the back ply, be they two or more, are all twisted in directly to the middle position, but the lowest element is always left out to form the outer twist. The left-out twist element of the previous ply of that side is then twisted in last under the left-out twist weft in front of it and forms the third and uppermost addition to the middle ply. It thus covers most of the inner twist formed by the extra elements and gives the braid a neat appearance.

When the braid reaches the near end of the basket, the weft elements left are continued on into a three-ply braid tail and knotted. Both tails are carried up on the outer side of the basket ends, pushed through to the inside and then the knots pushed through to the outside.

The basket described (Plate XIV, *C,* 3), though it has the technique of a superior *ola,* was used by chiefs to hold sennit braid that had not been hanked.

The name given to it by Tuitele was *'ato afa* (basket for sennit). The name is thus merely a functional name describing the use to which it was put by Tuitele. It could be used for other purposes but was too good to use for fish. Tuitele valued it highly and said the type was only made for chiefs.

The *ola* baskets used for fishing were also called *ola fangota* from their use. When used for carrying coconut shell water bottles, they were called *ola 'ave vai*. A basket used for keeping oil bottles was also called *tulula*.

ROUND BASKETS

Round baskets (Plate XV) made of closed leaflets with twilled strokes are made throughout Samoa but doubt exists as to whether the form has been introduced or whether it forms part of their own culture. Except for the idea of forming the round bottom there is nothing in the technique that marks any gap between it and the processes already described. As, however, the elliptical bottom of the rough coconut leaf basket has been attributed by the Samoans themselves to influence from Niue, the round basket may be an adaptation of local technique to an idea obtained elsewhere. It is worth describing even as an adaptation of the technique already described.

The size of the baskets ranges from the neat size figured in Plate XV to very large ones used for holding clothes. Their use as clothes baskets has led to their receiving the name of *'ato lavalava* (*lavalava,* kilt or skirt).

The rim is formed of two pairs of midrib strip, each pair supplying the opposing wefts after the leaflets have been twisted as in the *laulau* platters and the chief's basket. The commencement is the usual *fa'a'au* horizontal lines of twilled twos with the sinistral bearing strip to the outer side. Instead of horizontal twilled twos, the commencement may be made by lifting up three dextrals from behind three sinistrals and then dropping the dextrals alternately over the sinistrals. From this vertical lines of twilled threes are readily developed. The closure of the ends of the midrib strip at the rim is formed by the *so'o* join used in the *si'u ola* baskets. (See figure 105.) When the depth is reached, the plaiting edge is finished off evenly with a horizontal line of dextral twilled twos or checks.

The bottom rim. At this stage there is no deviation from the technique of the better class of *ola* baskets. If the sides were flattened in, and a two-course braid used to close the bottom, an *ola* would result. To form a round bottom, however, all the wefts must be turned in at right angles to the level plaiting edge. This is done by twisting each sinistral weft with a turn towards the plaiter so that it stands on edge with its midrib edge uppermost. It is then passed to the left round the next sinistral from the near side outwards where it receives another slight twist that againt flattens it with its midrib edge to the left. (See fig. 107.)

The bottom is continued in the horizontal plane round the inner circumference of the bottom rim. The contraction occurs naturally owing to the narrowing of the wefts which have changed from 0.4 inches on the sides to 0.3 inches and less on the bottom. Here and there if necessary two wefts may be run together to insure narrowing but little of this is necessary. In a basket 15 inches across the bottom, the plaiting was carried on in the usual twills for about 5.5 inches from the bottom rim circumference, leaving a circular gap of about 4 inches in diameter to fill in.

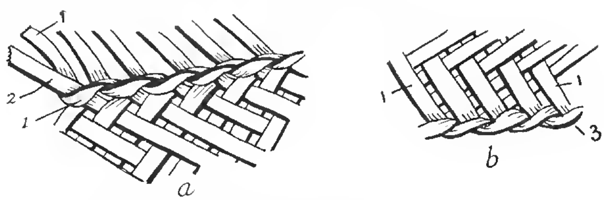


FIGURE 107.—Round basket, bottom rim twist: *a*, the sinistral (1) is shown being twisted around the sinistral (2) in front of it. The sinistrals now pass from the previous vertical plane of the sides to the horizontal plane under the twisted sinistrals but receive no twist themselves. The dextrals carry on automatically with circumferential lines of twilled twos or threes. *b*, The sinistrals (1) after passing under the twists (3) form a marginal line of twilled twos.

Closing the bottom. The free projecting wefts are then divided into four equal divisions. Each of these is plaited into a free three-ply braid tail which is knotted. Two braids from opposite sides are then drawn across the opening on the inside of the basket and parallel with each other. Each braid is passed through under the wefts that form the near ply at the base or beginning of the opposite braid. The wefts are the long outer wefts of the ply and easily admit a braid being passed up under them. The ends of the braids are then carried along the inside of the bottom and the knotted ends passed through under a couple of wefts towards the bottom angle, the knots remaining on the inside of the basket. The basket is turned over and the other two braids crossed side by side over the two fixed braids. Their ends are pushed down through the openings left. The ends are pulled up on the inside through appropriate wefts near the margin of the hole and then carried out to have the knots fixed under a couple of wefts near the bottom margin. (See Plate XV, *A*, 1.) In this manner the bottom is effectively closed and there is no danger of the braids giving way. The method of adapting a three-ply braid to close the bottom is quite in keeping with Samoan technique though some think that the round basket may have been introduced.

Variations in closing. Two variations from the above common method were noted: (*a*) the four braids instead of commencing at the margins of the central opening were commenced near the bottom rim and the wefts from the plaiting simply added to the braid on either side as the plaiting proceeded

towards the centre and the plaiting thus advanced nearer to the centre leaving a smaller hole which was filled in by the braids crossing to the opposite sides where they were fixed under crossing wefts; (*b*) a large basket made in Savaii had the dextral wefts twisted on the inside to form the bottom rim. The bottom which was 20 inches in diameter was plaited in check for about 6 inches in from the rim. A marginal three-ply braid was then run round the plaiting edge, but the wefts, after taking a couple of twists in the braid, were discarded on the side of the braid towards the centre. On completing the first round, the braid was continued a slight distance away with the previous discards and the method of dropping out wefts on the side to the centre was continued. In this way a continuous circular braid was plaited forming a flat spiral until the opening was too small to continue. A thick three-ply braid was then made with the remaining weft ends continued as a free tail and knotted. The method is not neat and resembles an experiment. (See Plate XV, *B*.)

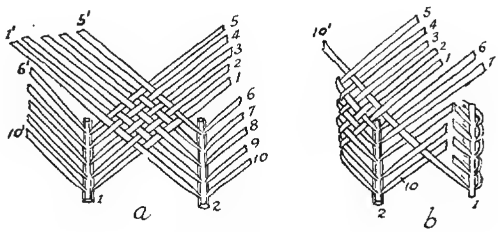


FIGURE 108.—Breadfruit cover (*pulou 'ulu*): *a*, leaflets from right side of midrib on left form dextrals through the alternating sets of which the sinistrals from left side of right midrib are successively plaited in check. There are now the leaflets on the right side of the right midrib (2') in line to act as dextrals with those already functioning as such. *b*, The left midrib (1) is brought around the back of the other (2) to be on the right. In this position the other leaflets will form sinistrals to continue the plaiting. The crossing of the dextral 3 will indicate the future plaiting edge to be attained to. The lower dextrals (6-10) are separated to carry on the two sets of alternates continuous with the upper ones (4-1). The nearest sinistral (10') is placed in position and the top dextral 5 turned down on it. In this way, each sinistral is added and the top dextral turned down until all have engaged and the plaiting edge commenced by turning down the weft (5) is level.

BREADFRUIT COVER

The breadfruit cover (*pulou 'ulu*) was demonstrated by an old man at Fitiuta, who maintained that it was an old technique which he alone in the district remembered. The name (*pulou*, head cover and *'ulu*, breadfruit) denotes its use in covering any special breadfruit to protect it from the flying-fox. Fraser (12, p. 178) in the myth of Taema quotes the words "Ona lafo ai lea le pulou 'ulu" (She threw then a breadfruit bonnet). Breadfruit covers were thus evidently used in ancient times, unless *pulou 'ulu* referred to something else. The cover (Plate XIV, *D*, 1) is made of two sections of coconut

leaf midrib carrying five or more leaflets on either side. These are placed slightly apart with the butt ends towards the plaiter and the upper surfaces upwards. The leaflets from the right side of the midrib on the left form the dextrals through the alternating sets of which, the sinistrals from the left side of the right midrib are successively plaited in check. (See figure 108.)

The plaiting edge forms the bottom. Here we have the dextrals all turned down and the sinistrals projecting upwards, the position similar to that in the *'ato* baskets. Making the leaf midribs form the sides, the plaiting edge is laterally compressed and the bottom filled in by the doubled-over, two-course braid ending in one free tail, as in the one-braid *'ato* basket.

The cover is readily slipped over the breadfruit selected while still growing on the tree and is left there as a protection.

MISCELLANEOUS BASKETS

In Savaii, small baskets similar in technique to the breadfruit cover (Plate XIV *D*, 2, 3) were used by children for carrying fruit. They were made of three and four midrib sections, each carrying three leaflets on either side. The plait and closure of the bottom was identical with the Fitiutuan cover. They were held to be a recent innovation, which they probably were, as there seems no particular use for small parcels in Samoan life, while larger ones are met by the use of the *'ato* basket. The *pulou 'ulu,* however, seems to have had a specific use supported by myth. Larger baskets were made in the Tokelau Islands with the same technique.

The basket figured in Plate XIV, *D*, 4 resembles the Cook Island *ohini,* said to be derived from the Tahitian *oini.* The technique is somewhat different to the usual type, but again local authorities maintain that they are new to Samoa.

PANDANUS LEAF BASKETS

Baskets are now plaited of pandanus leaf with the technique derived from floor mats. The check stroke is the usual one. The baskets are small and the commencing edge which is to form the bottom must have the weft ends projecting towards the plaiter sufficiently long to form the other side of the basket. The commencing edge is plaited in check for the width of the basket and continued in depth until the plaiting runs out in a triangle. (See fig. 109.)

When the depth of the basket is secured, the edge to form the rim may be turned down with a plain straight edge or a serrated edge may be made. Both finishes are described under sleeping mats. The basket is then turned inside out when the true outer surface of the wefts is exposed and the turned-down finish of the rim concealed on the inside.

The handles (*avei*) are made of strips of pandanus, forming a foundation around which four strips of pandanus are plaited in check so that the founda-

tion material is concealed. A loop is formed on each side of the rim by pushing the ends of the handle through the plaiting and knotting them.

Where the serrated edge rim is used, the knotted ends of the handle loop are concealed under the plaited finishing band of the rim.

The body of the basket may be decorated with a strip of *soa'a* plantain bark laid along a weft course and inserted under the crossing wefts.

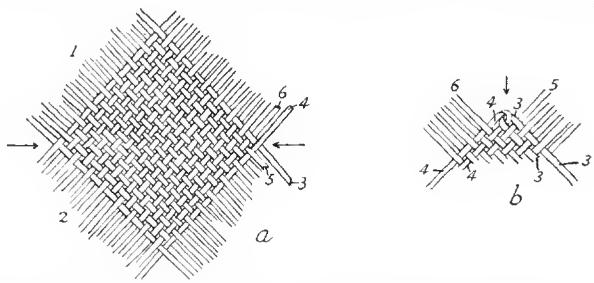


FIGURE 109.—Basket (pandanus leaf): *a*, The projecting wefts at the ends are left free. The plaiting therefore narrows along the marginal dextral on the left and the margin sinistral on the right. Some of the projecting free weft ends are doubled in over the margin and tucked under a crossing weft on the plaited part to prevent the side edges of the plaiting from unravelling. The plaiting is done with the true under surface of the weft material upwards. The plaiting is then reversed so that the free weft ends at the commencing edge may be plaited to form the other side. With the available wefts another triangle (2) is plaited resulting in a somewhat lozenge-shaped figure. One end of the original commencement line is shown where the line is indicated by the arrows. *b*, The plaiting is then doubled over on this line with the true under surfaces of the wefts to the outside. A corner is formed where the marginal wefts (3 and 4) cross each other. This is done by doubling the two marginal wefts around each other and returning them with a check movement in the direction of their previous course. The projecting wefts on the left are treated as working dextrals and those on the right as sinistrals. Commencing with the nearest (5), they are successively plaited in with the dextrals and the end of the basket is filled in. Though there is apparently a wide gap in the figure between the wefts (5) and (6), they are really close together owing to the doubling in of the plaiting. The other end is filled in similarly and the plaiting edge becomes continuous all around.

Samoans hold that such baskets are really a modern development made since women began to smoke and carry small articles not available in olden days. In pre-European days there was little use to which they could be put, though Pratt (23, p. 41) gives *'ete li'i* (finely made baskets) and *'ete mamanu* (ornamental baskets) in his dictionary, they could still be a fairly modern development. Nowadays they are made for sale. (See Plate XVI, *E*.)

BASKETS FOR STORING

Large baskets made of pandanus leaves, either *fala* or *paongo*, are said to have been made somewhat square or oblong and with a cover for use in storing kilts and skirts. They are called *tanga* but their manufacture had been forgotten according to my informants. The basket figured in Plate

XVI, *D* was made with double wefts of pandanus, as the bottom part shows. The sides have been covered by thin white and colored pandanus material split into narrow wefts to work decorative designs in twill. The decorative part is elaborated as a result of trade influence, as is also the small size of the baskets. The thick, coarse foundation wefts beneath the decoration follow the check plait shown on the bottom and at the rim. The wefts cross not obliquely but at right angles to the edges, as will also be seen later in the baby mats (*tapito*). It seems likely that the large, square or rectangular *tanga* baskets followed the technique of the model basket shown in Plate XVI, *D,* but without so much overlaid decoration. Turner (40, p. 275) figures a basket evidently of the *tanga* type with a cover and some oblique lines of decoration. The thick, double wefts in the models make a stiff basket that in a larger size would do excellently as a clothes basket for pieces of bark cloth.

FOUR-CORNERED BASKETS WITH ROUND RIMS

Edge-Partington (10, vol. 1, Pl. 76, No. 5) figures a basket that is evidently four-cornered at the bottom and has a round rim with a single, arched handle. Turner (40, p. 275) also figures a basket that appears to be of this type. I saw none, so they have evidently gone out of fashion.

The introduction of wooden chests has displaced the use of the *tanga* basket and the modern development of coiled work has extinguished any chance the model rectangular and four-cornered types may have had of surviving for trade purposes.

BASKETS MADE OF SENNIT

Baskets made of sennit (*'ato to*) were used in olden days and, though the technique is not plaiting, they are grouped here for convenience. They were used by *tufunga* (builders) to carry their adzes and tools for making houses and canoes and were thus called *'ato to* (*to,* to build). They are very scarce but one was obtained at Ofu and another in Savaii. The Savaii basket was said by the owner to have been in his family for eight generations, but the age may have been augmented by pecuniary motives. He called the basket an *'ato fa'apaupau* and quoted as his authority the saying applied to wicked people likening them to an *'ato fa'apaupau*. *Paupau* means ancient and has come to signify heathen to the Christianized Samoan.

The example basket shown in Plate XVI, *B,* is made of three-ply sennit braid but two-ply twisted sennit is said to have been also used. The technique has been forgotten for baskets but fortunately it survives in the scoop nets made for the small *ingana* fish in Savaii. (See p. 442.) There is thus no doubt that the technique is native wherever it may have diffused in from in pre-European times. In the Savaii basket, the rim was formed of seven strands

of sennit braid round which the working braid was looped after forming each mesh in the last row at the rim.

In the smaller Ofuan basket the technique is the same in all respects but the braid is smaller. It was described to Mr. Judd as an *ola fangota* (fishing basket) for carrying bait. The use of bait cannot be old. It was probably used for containing trolling hooks (*pa*) and line and the functional use of the name was loosely applied for the true *ola fangota* is made of coconut leaflets. The smaller basket obtained by Mr. Judd was the first of the type to be recorded from Samoa. Its authenticity as Samoan work was rightly doubted until the Savaii basket and the white bait scoop proved that the technique was known in Samoa.

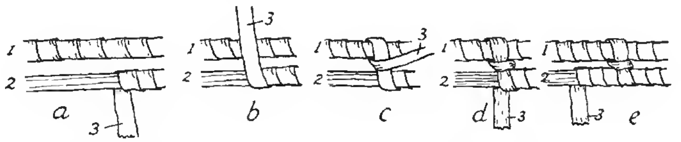


FIGURE 110.—Coiled basket technique: *a*, the coil (1) is an inner or upper coil already wrapped and attached to the preceding coil while coil (2) is the working coil that is being wrapped with the pandanus strip (3); *b*, to form the technical stitch, the pandanus strip (3) instead of making another turn around the working coil (2) is carried over the adjacent coil (1); *c*, the strip is brought around the back of coil (1) and passed through between the coils to the left of its first course. It is then turned transversely to the right to cross over its first turn. *d*, The end is passed back beween the coils on the right and after being drawn taut is inclined obliquely downwards at the back of the working coil (2) so as to come into position for continuing the wrapping. *e*, The wrapping of the working coil continues until the next stitch is required.

BASKETS IN COILED WORK

Coiled basketry was introduced into Samoa, and round baskets in various shapes and sizes are now extensively made for the tourist traffic. Though foreign, the technique has been adapted to local material and merits a brief description. The foundation of the coil is coconut leaflet midrib or strip of the leaf midrib (*lapalapa*) which may be varied in size according to the position in the work, being narrower and thinner towards the centre of the coil where work commences. Only one foundation strip is used, forming what Otis Mason (21, p. 246) termed a single-rod foundation. The wrapping and stitch material consists of bleached pandanus leaf split into strips about 0.2 inches wide. The strips of midrib in the outer coils are about 0.2 inches wide and barely 0.1 inch thick. The foundation strips are set on edge so that on the flat bottoms of the baskets and the covers the narrower thickness shows, while on the sides the wider widths show outwards.

Baskets commence in the center of the round bottom and the coil is worked from right to left. The foundation strip is wrapped in a close spiral with the pandanus strip. The turns on the outer side towards the worker run

obliquely upwards and to the left. The edges of the turns are close together without overlapping. The foundation coils are not brought into close apposition but are kept apart by the transverse turns of the stitch. No needle is used as the stiff end of the pandanus strip can be readily pushed through the space between the coils.

On the bottom the connecting stitches are made from the outer coil round the inner and on the sides with the bottom upwards, from the lower to the upper. The stitch is made from the coil that is being wrapped to the adjacent part of the coil already dealt with. (See figure 110.)

At the commencement the stitches are made close together but after the continuous coil is established the stitches are spaced more widely. They are now arranged to form various patterns as shown in Plate XVI, *A*. Round or oval platters are also made and the baskets may have a single long handle, or flat covers with a rim. Round baskets with the same stitch are present in the Caroline Islands and the technique may have diffused to Samoa from that area.

MATS

COCONUT-LEAF MATS

The roughest type of floor mat was made from coconut leaves, hence the name *polavai*. In olden days it had considerable status, as it was the proper type of mat upon which to place the gods during religious ritual. The name *apa'au* or *tapa'au vai* is connected with the ancient religious aspect of its use. The *polavai* are still in common use as the undermost layer in the carpeting of a house with floor mats. They are easily and quickly made and by taking the direct friction against the gravel of the floor they save the upper mats of pandanus leaves. See Plate XVI, *C*.

Younger leaves with more perfect leaflets are selected. Two six-foot lengths are selected to provide pairs of right and left midrib strips. The pairs of a kind are placed together so that their closed leaflets coincide, and a pair of leaflets used as one element in arranging the commencement. They are laid down with the butt ends towards the worker, the under surface of the leaflets turned upwards, the midribs to the middle line and the strip from the right side of the leaf thus on the left. (See figure 111.)

Apart from neater workmanship, the floor mat is the opposite of the carrying sheet in which the outer edges are formed by the midrib strip and the two sides joined together by a three-ply braid in the middle line.

The *polavai* is the *pola* placed inside the house and, according to some Samoans, is the *polataufale* (*pola* within the house) in distinction to the *polataufafo,* the wall screen that hangs to the outside.

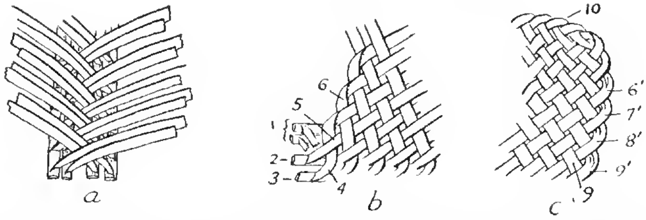


FIGURE 111.—Coconut leaf mat (*polavai*), technique: *a*, pairs of leaflets (one from each midrib strip) are crossed over the middle line alternately from either side, commencing with the left. When the whole series have been so dealt with, leaflets from either side are tied in a reef knot as a *fa'alave* (fastening) to prevent the ends working apart during plaiting. In crossing the leaflets over, the midrib strips are also turned where they lie and the upper surfaces of the leaflets now face upwards. The elements of each midrib pair also work slightly apart so that one is nearer the middle line and will be termed inner while the other is outer. *b*, The plaiting stroke is the check and the wefts are single, closed leaflets. The leaflets on the left side of the middle line, which come from the midrib strip to the right are plaited first. The material is therefore twisted around with the butt ends to the left. In this position the leaflets to be dealt with run naturally towards the right. The plaiting will therefore be left handed and start from the left. The first pair of leaflets from the left midribs (1) are cut off in the figure. The leaflets from the inner right strip (2) are treated as natural dextrals to form the working edge while the leaflets from the outer strip (3) are successively bent to the left with the right hand to lie in the shed as sinistrals. The first stroke is made by turning the end leaflet from the outer strip (4) to the left under the first natural dextral from the inner strip (5). With the check plait this is commenced; first dextrals and sinistrals are added on the right to build up a working edge. In building up the working edge, the sinistrals as they cross the left marginal edge must be turned in to function as dextrals and in doing so form the left edge. Thus, the first sinistral (4) after crossing under the first dextral (5) is given a half-turn over the next sinistral (6) after it is in position. The following sinistrals are given a half-turn over the sinistral above it and the left edge is formed. When a sufficient depth has been turned to assist in forming a convenient working edge, the top turned weft may be kept from unravelling by doubling back the sinistral above it and fastening it down by pushing it under a crossing weft on its plaited course. The working edge is carried along until it reaches the right end. *c*, The right edge is formed by turning in the projecting dextrals with a direct bend which does not reverse the surfaces of the weft. The lowest dextral (9') has crossed over the last sinistral (9). It is therefore turned in to cross under the projecting dextral above it (8') in order to comply with the check technique. Similarly (8') crosses under (7') and so on up the right edge.

When the full depth of the plaiting has been reached, the ends of the plaiting edge are secured by doubling back wefts over the last turned in wefts of the sides and securing them temporarily under crossing wefts on the plaited part.

The plaiting is now turned with the butt ends towards the right and the unplaited half in position before the worker. The natural direction of the leaflets is here towards the left. Plaiting therefore commences on the right. The naturally directed sinistrals are taken from the inner midrib strip and the leaflets from the outer strip are bent under the sinistrals to act as dextrals. The procedure is that of right-hand plaiting, where the working edge is formed by sinistrals worked by the right hand, while the left hand bends the dextral into the shed provided. The side edges are worked with the half turns on the right and the direct bend on the left. In the outer edge braid finish (*fili*) the plaiting edges left on each side of the middle line are finished off with a three-ply braid (10) made exactly in the same way as the wall screens (figure 90). The butt ends of the midrib strip are towards the plaiter with the true upper surface of the leaflets upwards.

The braiding then commences at the far ends of the plaiting edges. It is immaterial on which side of the middle line it is, the braiding principle is the same. The leaflet ends that incline towards the plaiter are added to the braid from the inner or plaited side while the leaflets that incline away are added to the ply in the middle position from the outer side. At the near end of the plaiting edge, the braid is continued on as a free tail, knotted, and then turned back on the under surface where it is kept by anchoring the knot under a couple of crossing wefts of the body. (See Plate XVI, *C*.)

PANDANUS MATS

Material. In mat making the Samoans use three kinds of pandanus, distinguished as *paongo, fala,* and *'ie.* As the leaves are used the material is generally referred to as *laupaongo, laufala,* and *lau'ie.* All three plants were seen growing in cultivation, where they were tended by keeping the larger growth cleared. In cultivation the trunks were a few feet high, ending in a single head of leaves. The old, dry leaves were removed and frequently the lower, outer leaves of the *'ie* were bound round with a strip of dry leaf to prevent them from falling down. Leaves from uncultivated plants may be used as an expediency, but, for her mat material, the Samoan woman goes to her cultivated plants.

Of the three plants the *paongo* has the longest and widest leaf. Some of those measured that were lying out to dry were 10 feet long and over 4 inches wide. The edges of the leaf are serrated with sharp spines and the under surfaces of the midrib are also armed with long spines. From the *paongo* are made coarse floor mats (*papa* or *paongo*) with very wide wefts. The correct name is *paongo,* as given by Pratt (23, p. 229), but many Samoans, owing to a modern tendency to corrupt the *ng* sound into *n,* refer to the plant as *paono.*

The *fala* has a much smaller leaf, dried specimens measured being 5.5 to 6 feet long and 3 inches wide. It also differs from the *paongo* and the *'ie,* in having smooth edges to the leaf and but occasional spines on the back of the midrib. From the *fala* are made floor mats with a narrower weft, sleeping mats, and the small mats made for babies, which receive the general name of *fala.* The term *fala* is also applied to the fruit of the pistillate plant of all species, the keys of which are used for making necklaces (*'ula fala*).

The *'ie* has a leaf much the same size as the *laufala.* A cooked specimen measured was over 5 feet in length and its width near the trimmed base of the leaf was slightly over 3 inches. It differs from the *fala* in having serrated edges with closer, smaller spines than the *paongo* and a close set of spines along the under surface of the midrib. From the upper layer of the horizontally split leaf, the *'ie tonga* fine mats used as garments are made and also, on occasion, some finer sleeping mats. The *'ie* must not be confounded with the *'ie'ie,* which is a *Freycinetia* and from the roots of which fish traps are made.

Setchell (29, pp. 116, 201), from a cultivated specimen procured for him by a Samoan who called it *paono,* recognized the plant as *Pandanus whit-*

meeanus Martelli. Setchell's description of the leaves, being as long as three meters and possibly longer with a width of ten centimeters, fits in with the characteristics of the *paongo* described above. He is wrong, however, when he suggests that the material of the *'ie tonga* fine mats "Is probably *paono* (*Pandanus whitmeeanus*) . . ."

Setchell also gives the name of *fala* to *Pandanus tectorius* and its two varieties of *P. saviensis* and *P. upoluensis* described by Martelli. His specimens, however, were from uncultivated plants. Dr. Forest B. H. Brown, after a comparison of the cooked Samoan *'ie* leaf with an intact tip end to specimens of *P. tectorius* from other regions, was of the opinion that the *'ie* belonged to *P. tectorius,* but there was not enough material available to locate the variety. From my description of the cultivated *fala* he was of the opinion that it closely resembled *P. tectorius* var. *laevis,* which is also cultivated for mat material in the Society, Cook, and other islands to the east.

The adult, uncultivated tree pandanus with many branches and aerial roots is known as *fasa* and the efflorescence as *singango*. When there is a fruit, the tree seems to take the name of *fala* as well as the fruit. Reinecke (25, p. 58) has summed up the position that the staminate tree is called *fasa* and the pistillate, *lau fala*. In *lau fala, lau,* of course, refers to the leaf.

Preparation. The *laupaongo* are trimmed along the midribs to remove the sharp spines, and the spinulose-dentate margins are split off. This is termed *autala*. The leaves are spread out in the morning to dry in the sun (*fa'ala*) and gathered in at evening for a period of four or five days. Each individual leaf is then rolled round the left hand to open out the curled-in margins, thrown in a heap, and then rolled round the hand and other leaves added until a fair-sized circular roll one leaf in width is produced. The process and the roll is called *fa'amasina* (to make like a *masina*—a moon). The roll is kept together usually by four radial ties of *fau* bast or pandanus leaf strips which pass through the hole left on removing the hand.

The *laufala* are trimmed (*autala*) in the same way to remove the few midrib spines and smooth margins. Each leaf, commencing with the tip end, is then rolled round the left hand. The butt end is then doubled into the coil and at the same time the right hand draws out some of the middle loop, the left hand holds the tip end against the bent-in butt. The drawn-out turns form a loose spiral and the process is termed *sapine*. A number of leaves are attached loosely together by passing a strip of *fau* through the end loop of the leaves and knotting the ends of the strip together. The process is *tui laufala* (*tui,* to thread together) and each bundle is a *taulanga laufala*. They can thus be carried out and brought in more readily by means of the *fau* strips. The leaves are exposed to the sun (*fa'ala*) for 4 to 7 days. Straightening out both the leaf and its margins is termed *fa'amafoloa*. The leaf is rolled round one hand and then reversed by rolling it around the other hand.

All leaves thus treated are rolled into *fa'amasina* bundles (also termed *ta'ainga*) and then stored.

The preparation of the *lau'ie* is described on page 275.

Before plaiting, the rolls are untied and each leaf straightened out by scraping along the back or outer curve with a shell. The leaves may be further straightened and smoothed by rescraping with the shell. Each half leaf is then split from either side of the midrib which is discarded. At one time the splitting was done with a sharp point of bone or the spine of a porcupine fish but now a knife is used. The plaiter then splits the half leaves into the required widths for the wefts with the sharp point. The process is called *totosi*. A point was also obtained from the shell of the *'u'u*, a species of mussel. The splitting usually commenced a few inches from the butt end

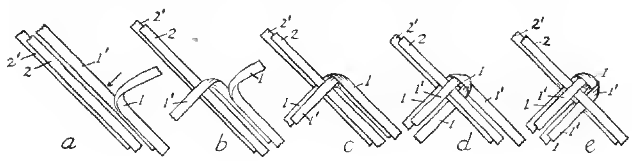


FIGURE 112.—Pandanus mat (*paongo*) double weft commencement: *a*, the two double wefts are laid parallel in a diagonal direction leaning towards the left, a point (see arrow head) is selected somewhere towards their middle for making the corner, and the upper element of the right weft (1) is raised out of the way; *b*, the lower element of the right weft (1′) is then bent upward at right angles with a half turn and turned to the left over both elements of the double weft (2, 2′); *c*, the upper right element (1) is then straightened out and bent with a half turn backwards around the bend already made by the lower element (1′) and turned to the left to pass between the two elements of the left weft (2, 2′). To do this the upper element (2) is raised with the left hand and after the turned weft (1) has passed over the lower element (2′), the upper element (2) is dropped back over it. The bend made by both elements of the right weft forms the far edge of the corner.

The principle may now be laid down that, in bending weft elements to form a marginal edge, the upper element of a double weft will always be bent backwards and the lower element upwards. Furthermore, in interlacing two double wefts, the check technique must be maintained with the individual elements. Hence the two elements of a double weft must not be separated from each other by more than one element of another crossing weft. When the lower element (1′) was turned forward over both elements (2, 2′) of the crossing weft on the left, the upper element (1), when it was turned backwards had to pass between the two crossing elements (2 and 2′). The above principle applies only to turns at the corners and the marginal edges of the mat. *d*, The right edge of the corner must now be formed by the lower ends of the right double weft. It is obvious that the lower element (1′) on being turned forward to occupy the upper position must pass below the upper element on the left (2) in order to comply with the check technique. The upper element (1) on being turned back must pass below the lower element on the left (2′) or in other words below both left elements. It is more convenient to commence with the latter movement. Both elements of the left weft (2, 2′) are, therefore, raised and the upper right element (1) is bent back at right angles on itself, passed to the left and the left double weft dropped over it. *e*, The lower right element (1′) is now bent upward at right angles around the margin defined by its weft mate (1), the upper left element (2) is raised and then dropped over the right element (1′) after it has crossed the lower left element (2′).

of the leaf so that there was an undivided portion of leaf keeping the wefts together.

PAPA OR PAONGO MATS

The wefts in the coarse *papa* mats (Plate XVII, *A*, 1) made of *lau-paongo* were an ineh or more in width. Two strips of leaf were used as double wefts and were reversed so that a tip and butt end eoineided to insure an even thiekness in the double weft. Where a half leaf produeed two wefts, the undivided butt portion was run out to the end to separate them. The right forefinger and thumb held the butt end of one strip while the butt end of the other was reversed between the seeond and third right fingers. The left hand seized the butt end of the seeond strip and the two hands were drawn apart, thus reversing the ends of the second strip and forming the double weft.

Plaiting eommenees by defining the eorner (fig. 112) and is extended from the eorner by adding double wefts to the left. (See fig. 113.)

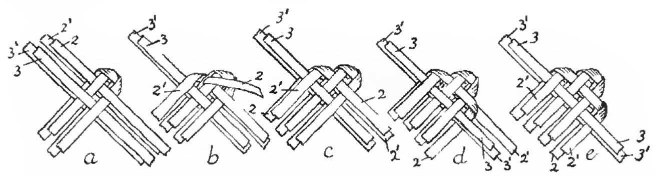


FIGURE 113.—Pandanus mat (*paonga*), first corner: *a*, a third weft (3, 3′) is added on the left by placing it parallel with the second weft and interlacing its elements with the two crossing wefts formed by the bent in limbs of the first weft. The check technique between individual elements is usually carried out with the third weft only in order to flatten down the corner. *b*, The far edge is defined by the second weft in exactly the same way as the far edge of the corner was defined by the first weft. Hence, the upper right element (2) is raised out of the way and the lower right element (2′) is bent forward at right angles and passed to the left over both elements of the left weft (3, 3′). *c*, The upper right element (2) is straightened out and bent backwards around the margin formed by its pair mate (2′). The upper left element (3) is raised and dropped over the working right element (2) after it has crossed the lower left element (3′). The bend formed by the second weft thus continues the far margin commenced at the corner. *d*, The right margin is further defined by the second weft in exactly the same manner as the right edge of the corner was defined by the first weft. Hence, both elements of the left weft (3, 3′) are raised, the upper right element (2) is turned backwards at right angles to pass to the left and both elements of the left weft dropped over it. *e*, The upper left element (3) is raised, the lower right element (2′) is bent upwards at right angles around the margin formed by (2) and after it has passed to the left over the lower left element (3′), the upper element (3) is dropped over it.

As eaeh subsequent weft is added on the left, the eheek technique is maintained with the double wefts but not with their individual elements exeept at the marginal turns forming the edge whieh are a repetition of the technique shown. When suffieient wefts have been added to get a working edge of dextrals, the plaiter twists the plaiting into a convenient position so that she may work in orthodox fashion.

The *papa* mats may be made in any size, but the common form is a little over 2 feet wide and 6 to 7 feet long. It is usual to plait one short end and then plait sections across the length so that the wefts may be turned in at the sides, thus employing fewer wefts on the shorter sections. After forming the first corner, the corner is turned to the left and a working section carried along until the 2 feet width is obtained. The next corner is then turned as in figure 114.

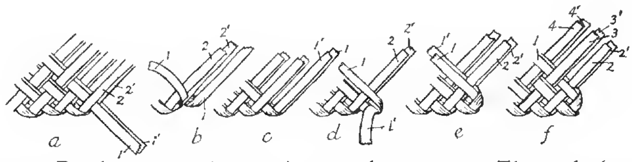


FIGURE 114.—Pandanus mat (*paonga*), second corner: *a*, The weft (1, 1′) is the last added and the weft (2, 2′) has been turned in the orthodox way. In order to form the corner with the right weft (1, 1′) it must be turned in two turns of right angles so as to return into the plaiting parallel with its previous course. *b*, The upper right element (1) is lifted and the lower element (1′) turned forward at right angles to its course to be parallel with the left weft (2, 2′). *c*, The upper right element (1) is straightened out and turned backwards at right angles to pass around the lower edge margin defined by its pair mate (1′). This completes the first right angle turn. *d*, The upper right element (1′) is now lifted out of the way and the lower right element (1) is turned upwards at right angles to pass over both elements of the left (2, 2′). *e*, The remaining right element (1′) is straightened out and the upper left element (2) lifted. The right element (1′) is then bent backwards at right angles around the right edge margin defined by its pair mate (1) and turned to the left over the lower left element (2′) when the upper left element (2) is dropped over it. *f*, The double weft (1) is then carried back along the working edge as a sinistral, and the corner is defined. In the next movement, the weft (2) will be bent in and plaited with the elements of 3 in the usual edge technique shown in *d* and *e*.

When the various working sections which have the left and right edges defined by the edge technique have resulted in the mat nearing the required length, the left edge and left corner are completed. The far edge and far end of the right edge are reached by turned-in wefts from both margins. They are simply left on as extra thick wefts and instead of turning single elements at the remaining parts of the edges, two strips of material may form each turning element of a weft. In some mats, the extra strips are cut off before reaching the edge turn. These extra strips are then turned individually at right angles and run back by being pushed under crossing wefts already plaited. They give the false appearance of a double edge. The true edge formed by orthodox technique is distinguished by the turning wefts forming triangles. On turning the extra wefts forward, they cross not only a triangular space but the next full weft space as well before they pass under a crossing weft, as will be seen in the upper left corner of Plate XVII, *A*, 1.

At the last corner where the working edge runs out, the turned-back wefts have to be pushed individually under a sufficient number of crossing wefts already plaited in position to fix them.

New wefts are added by simply laying them on the shortening wefts and plaiting them together for a number of strokes. The shortening weft is then dropped and subsequently cut off close under a crossing weft to hide the end.

Sometimes *papa* mats are marked by a woman making two or three nicks, or steps, at a corner, or putting in a short row of twill on the body to distinguish her own property.

FALA MATS

Mats made from *laufala* have received the name *fala* from the material. The name has come to be used generally and may be carelessly applied to mats made of *paongo*. They may be divided into floor mats and sleeping mats for which a different technique is used. With sleeping mats may be included the small special mats made for babies.

Floor mats. The *fala* material does not admit of such wide wefts as the *papa*. An average weft is 0.5 inches. They may be made in the same sizes as the *papa* or much larger. Very large mats have been made to carpet the rooms of foreign houses but such forms were inconvenient for strictly Samoan use. The smaller sizes are more convenient for rolling up and stacking away on the house shelves, and on ordinary occasions only such parts of the house were covered with mats as were in use. The smaller sizes were also more convenient for pushing aside to expose the gravel floor on which a kava libation could be poured or a round-bottomed receptacle set by scraping away the stones.

Double wefts with a check stroke and the individual element turn at the corners and edges were used as in the technique of the *papa* mats. There is no difference except in the nature of the material and the width of the wefts. (See Plate XVII, *A*, 2.)

Sleeping mats (*fala moenga*). In the sleeping mats the single narrower wefts were used, averaging about 0.25 inches or narrower. Though the check formed the basis of the technique, twills were commonly used and change of stroke as in the wall screens and *laulau* platters were introduced as structural decoration. Applied decoration, by overlaying with the black strips obtained from the outer skin at the base of the plantain trunks (*soa'a*), was used sparingly or probably not at all in olden days. So also the structural decoration by means of wefts dyed black with *lama*, to be seen on mats with or without introduced worsted fringes (Pl. XVII, *C*, 2) are probably as modern as the colored wool material. Tourist traffic has given a greater incentive to the use of color.

Plaiting (*lalanga*), qualified by the number, supplies the name for the plaiting strokes used. Thus *lalanga tasi* denotes check and *lalanga lua, tolu, fa, lima* gives the twills from two to five. A combination of strokes may be

similarly denoted as *lalanga lua ma lalanga tasi* (twilled two and a check). The term *si'i* (to lift) is also used with a number to denote twills as *si'i lua* (twilled two), *si'ifa* (twilled four). Instead of *lalanga, lau* (weft) may be used as *lautasi* (check) and *laulua* (twilled two).

The half leaves of prepared *fala,* usually about 1.25 inches in width, are split (*totosi*) into five wefts, commencing at a few inches from the butt end and running out at the tip end. (See fig. 115.)

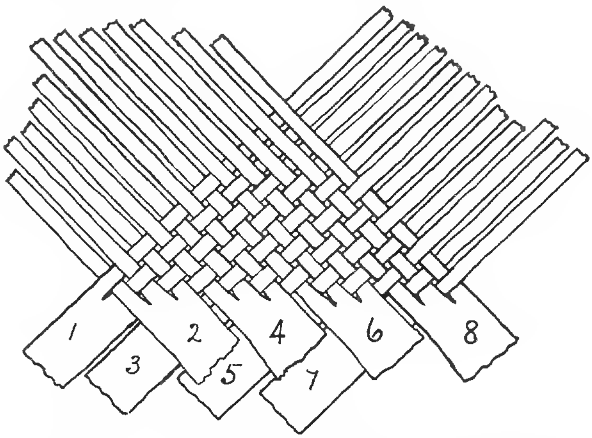


FIGURE 115.—Sleeping mat (*fala*) double butt commencement: The commencement is made by crossing two butt strips (1, 2) with the under side (*tua*) of the leaf uppermost and the sinistral bearing strip above (2). In this position, the sinistrals are held by the right hand while the left hand manipulates the dextrals in turn according to a commencing transverse check or twill while the right hand drops the sinistrals into position in turn. The technique is similar to that in the wall screens and *laulau* but instead of the whole line of crossing wefts being in position, the dextral (3, 5, 7) and sinistral (4, 6, 8) butts are added on the right as the last weft of the previous strip is used. The left hand also retains the dextrals until a sufficient number to form a working edge are engaged. Then with each rearrangement or movement of dextrals, the top working dextral is dropped and the next dextral picked up. In this way the width of the commencing edge is reached.

The Samoan commencement corresponds to the Cook Islands *hatu rua* (39, p. 110).

The side edges are usually formed by binding in the marginal projecting wefts directly without a half turn as in the *afeafe* turn of the *laulau* platter. In some mats, a half turn is made as the projecting sinistrals on the left are turned in at right angles to function as dextrals or as the projecting dextrals on the right are turned in to act as sinistrals. The side edges formed by the above two methods are plain and simple. (See fig. 116.)

Adding fresh side wefts (*fa'aulu*). In some mats, in order to afterwards make more elaborate side edges, the wefts are left projecting at the side edges for subsequent treatment. The plaiting, however, cannot advance in a

vertical edge on the left if the sinistrals are merely left out as they reach the marginal line. They have hitherto supplied the crossing dextrals by being bent in at the left margin. If they are to be left projecting, fresh dextrals must be added from the left margin. This is done as in figure 116 *c*, by adding fresh butt strips and adding their weft strips successively from below up as the left margin is built up to start another working section. Similarly, on the right, fresh sinistrals have to be supplied as each working section reaches the right in order that the right margin may be defined in closing up the section to the level of the plaiting edge.

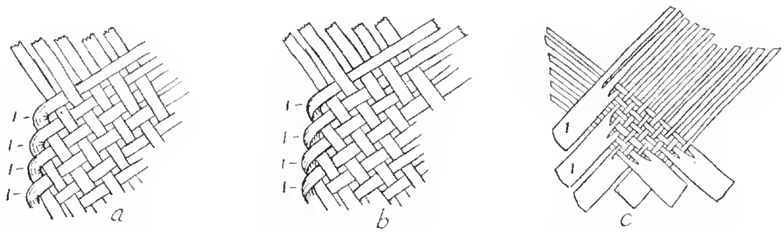


FIGURE 116.—Left edge of sleeping mat, methods of turning in the sinistral wefts: *a*, the wefts (1) are turned in to function as dextrals by a direct bend without exposing the other surface; *b*, the wefts (1) are turned in with a half-turn which brings up the other surface of the wefts; *c*, fresh dextral weft butts (1) are added to the left margin of the plaiting to build up the left edge with each successive working section.

The finishing edge. The Samoan method of finishing off the far edge of the mat is simple. The finishing technique is carried out along the plaiting edge of the last working section, by turning down the top dextral which would otherwise be dropped out of the working set of dextrals. The top dextral is turned down on the working sinistral that is placed in the shed prepared for it and included with the sinistral between the crossing dextrals as the movement is completed. (See fig. 117.)

On the right end of the finishing edge, the last few wefts which have no depth of working edge in which to be fixed, are plaited on as a free three ply tail which is knotted, doubled back on the under surface, and fixed under a couple of crossing wefts of the completed plaiting.

The object of plaiting the mat with the under surface turned upward is now apparent. The turned-down wefts with their cut-off ends are on the under surface of the mat and prevent any irregularities from appearing on the true upper surface when the completed mat is turned. If a mat is plaited with the true upper surface upwards in order to work out some geometrical designs, it is always turned under side upwards to plait the finishing edge.

When the turns of the top dextral are made to define the finishing edge, the top dextral is raised and then dropped on the sinistral placed in the shed. The half turn made by the dextral is thus above the sinistral which projects

behind the dextral turn. When cut off, the end of the sinistral can be seen at the edge. In some neat mats, the projecting sinistral end is cut off and the top dextral passed behind the end. In making its half turn upward, the cut off end of the sinistral is buried in the turn made by the dextral. This technique gives a smooth edge.

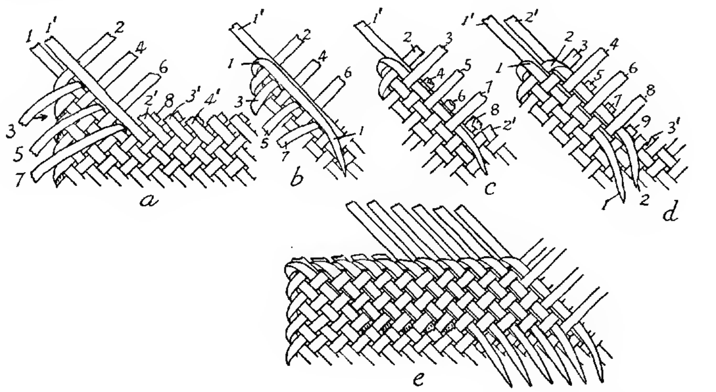


FIGURE 117.—Sleeping mat (*fala*), finishing edge: *a,* The plaiting edge of the completed section on right. The left edge has been worked up until a working edge is obtained. The working dextrals consist of two sets of three; the recumbent set (2, 4, and 6) and the raised set (3, 5, 7). The weft (1), were it not for the left edge, would be turned forward as the discarded top dextral. Into the shed formed, the sinistral (1′) has been placed. *b,* According to the rule laid down above, the discarded top dextral must be turned down on the sinistral (1′). The weft (1) which has reached the edge as a sinistral is given the turn it would have received had the plaiting continued up the left side and brought across the sinistral to function as a dextral. It is then given another half turn and turned down at right angles to lie on the sinistral (1′). *c,* The check movement is made as usual by dropping the top raised dextral (3), picking up (4) and so alternately until the raised set (3, 5, 7) have been crossed over the sinistral (1′) with the turned down weft lying on it and the other set (4, 6, and 8) are raised and held in the left hand. Note that as the top working dextral (2) of the last working set has been discarded the next dextral below (8) has been picked up to complete the working set. The shed has also been formed for the next sinistral on the right (2′). Below the last crossing weft of the series brought over (7), the free end of the turned down dextral projects. With the disposal of the first turned down dextral, the technique is established. *d,* The next sinistral (2′) is placed in the shed prepared by the last movement. The discarded top dextral (2) is turned down at right angles on it. The movement is completed by crossing the raised set of dextrals (4, 6, 8), picking up the recumbent dextrals (5 and 7) and the next dextral below (9) to complete the working series as the top dextral (3) of the previous movement has been dropped out of the working dextrals. The shed is automatically prepared for the next sinistral (3′), upon which the dropped top dextral (3) will be turned down. *e,* The automatic combination of this technique is shown. When completed, the long ends of the turned down dextrals are cut off below the last crossing dextral and the projecting ends of the sinistrals are also cut off at the finishing edge as shown in the left of the figure.

The commencing end finish. The commencing end of the mat with two sets of crossing, unsplit butt strips is now turned to the front, still with the

true under side upwards. The butt strips are split by running out their component wefts from the edge of the completed plaiting. This results in a level plaiting edge with projecting sinistral and dextral free weft ends. The plaiting is continued up the left edge until a working edge is secured and then turning down the top dextrals in exactly the same way as described in the finishing edge. The ends of the still projecting sinistrals are cut off at the edge and the turned down dextrals on the body treated in the same way.

The varieties of the technique used in turning mat edges that were observed in the field, and on mats acquired by Bishop Museum are here classified, but there may be others that were not available for this study.

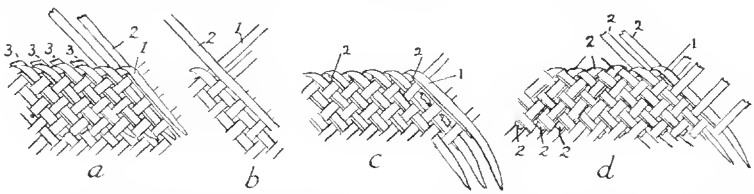


Figure 118.—Sleeping mat (*fala*), types of end finish: *a*, exposed sinistral ends. In the technique described, the dropped top dextral (1) is lifted up and turned on the *upper* surface of the sinistral (2) placed in the working shed. The sinistral ends (3) when cut off can be seen when the edge is examined as seen on the left of the figure. *b*, Concealed sinistral ends. The dropped top dextral (1) is passed *behind* the sinistral (2) lying in the shed. *c*, The sinistral is cut off above the lower margin of the dextral crossing behind it. When the dextral (1) is given a half turn, the cut off end of the sinistral (2) is effectively concealed by the turn. Without knowing the technique, one wonders how the ends of the sinistrals were disposed of. See margin on left of *c* and compare with *a*. *d*, The tucked-down sinistral edge. Following the usual technique (*a*), the dextrals (1) are turned down at the working edge and the sinistrals (2) left projecting behind them. Each sinistral (2) is then given a half turn at the edge when it projects downwards at right angles to its previous course, and lies on the plaiting, along the course of the dextral that was previously turned down on it at the working edge. Usually three crossing wefts that cross over the dextral course are selected and the sinistral is cut off so as to coincide with the required length. The end of the sinistral is pushed through under the crossing wefts, the sinistral weft is drawn taut and the end concealed under the lowest crossing weft of the series. All the sinistrals are so dealt with and the result is a firm even edge.

Direct bend. This is the *afeafe* bend used at the side edges where the wefts are turned in successively at right angles to their course without changing the exposed surface of the weft. (See fig. 116 *a*.) Owing to the difference of color and appearance of the true upper and lower surfaces of the weft material, the true upper surfaces of the weft must be kept to that which will form the true upper surface of the mat. A half turn at the right and left edges would cause the under surface of the weft material to appear on the true upper mat surface and spoil the appearance. This technique is used in wall screens and *laulau* platters for a similar reason.

Half turn. The half turn which exposes the other surface of the weft

is used at finishing edges because the change which is on the true under surface of the mat, will not show when it is in use. It, however, only disposes of functioning dextrals and forms only part of the technique. (See figs. 116 *b* and 117.)

The half turn is used at side edges when the wefts contain two elements. Double wefts are arranged back to back so to speak so that the smoother, more shiny true upper surface faces outwards on both surfaces. In such cases, the half turn makes no difference in appearance to either mat surface. This is evident in the *paongo* and *fala* floor mats and in the baby mats made with this technique. Being used at the side edges, where the projecting weft of one series is converted by the half turn into the commencement of the other series, there are no projecting ends left to dispose of and the method thus forms a complete technical process. (See figures 112, 113 and 114.)

The cut-off sinistral edge. This is the end finish described which forms the complement to the half turn method adopted with functioning dextrals. Two forms are in use. (See fig. 118 *a* and *c*.)

The tucked in method applies to the finishing and commencing ends of mats. (See fig. 118 *d*.) As it is somewhat tedious, it is usually reserved for baby mats or for more ornamental sleeping mats in which color has been introduced. It can also be applied to the side edges, when wefts have been added to the sides to form side plaiting edges.

The two-side three-ply braid. In a baby mat, the three-ply continuous braid made along one surface with the projecting free sinistrals and continued on down the other surface with the free dextrals, as in the *laulau* platter finish, was observed. (See figs. 95 and 96.) The narrower wefts, however, were more neatly brought in with a flat, half turn and instead of being finished off with a free, braided tail, the end wefts were pushed through the commencing wefts to continue the braid which is thus continuous without any apparent end. The weft ends, discarded after a course in the braid, were neatly cut off.

The serrated edge (*fa'atalatala*). The serrated edge (*talatala,* with points) is formed of sets of three or more crossing wefts plaited to form triangles of which the base is formed by the original plaiting edge and the sides by free edges obtained by doubling back the wefts which project beyond the marginal wefts defining them. In figure 119, sets of four are used.

The second part of the process consists of dealing with the free ends of the wefts used in making the triangles. The points of the serrated edge are now turned towards the worker, as in figure 120. The technique is simply that of the finishing edge. (See fig. 117.) The method forms a separate, distinct band of plaiting on the plaiting side of the serrations, distinct from the plaiting of the body, and has a free edge formed by the dextral turns. This is the common form, but in some better mats, where the sinistrals have

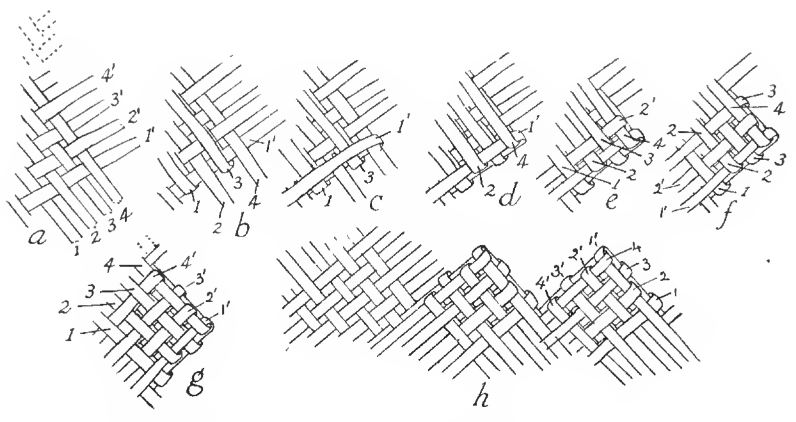


FIGURE 119.—Sleeping mat (*fala*), serrated edge technique: *a*, the plaiting edge is defined by the dotted line of checks placed longitudinally to the plaiter with the free ends projecting to the right. In this position, four dextrals and four sinistrals are continued in check plaiting for as far as they cross each other. The positions are now reversed for what were originally sinistrals now function as dextrals. Of the set so dealt with, the near dextral (1′) and the far sinistral (4) define the sides of the triangle. All wefts projecting beyond them are to be doubled back with a continuation of the check technique. *b*, Commencing with the near side formed by the dextral (1′), the sinistrals (1 and 3) which pass under it are doubled over it and the other pair (2 and 4) which pass over it are left. *c*, The marginal dextral (1′) is doubled back on itself; *d*, the remaining pair of sinistrals (2 and 4) are then doubled forward over the marginal dextral (1′), thus defining the plaited near edge. The two pairs of sinistrals (1, 3, and 2, 4) are the working wefts in this technique. *e*, Continuing the check, the pair (1, 3) is raised, and the next weft projecting beyond the far edge (2′) is doubled back on itself and over the recumbent pair (2, 4). The raised pair (1, 3) is dropped over it. *f*, As the pair (1, 3) was dropped, the other pair (2, 4) was picked up and the next projecting weft (3′) laid in position and covered. *g*, As the pair (2, 4) was dropped in the last movement, the other pair (1, 3) was picked up, the last projecting weft (4′) placed in position and on dropping the pair (1, 3) the triangle was completed. *h*, Beyond the completed triangle, the next set of four crossing wefts which are similarly numbered are similarly treated. The method is carried out along the full length of the plaiting edge to be so treated.

been carried back for some distance on the body of the mat by pushing the ends under a number of crossing wefts, the band edge is bound down to the plaiting and gives the appearance of a different technique. In some mats, these sinistral weft ends are carried back for six inches and in following the wefts on which they lie, they naturally comply with any change of stroke on their course. Their disposal is thus effectively concealed.

The sleeping mats with serrated edges usually have the serrations carried around on all four edges. (See Pl. XVII, *C*, 1.) In forming the side edges, new wefts have therefore to be added at the sides (*fa'aulu*) to provide the crossing elements, and the direct bend or half-turn edge can not be used.

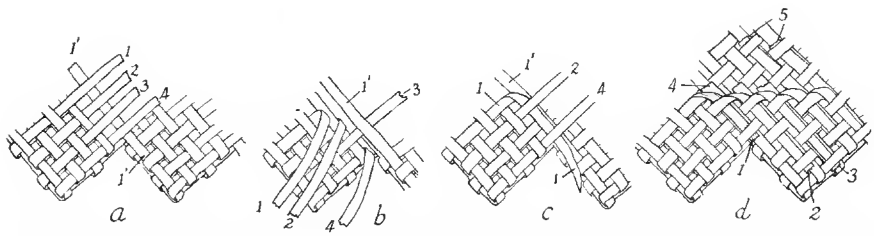


FIGURE 120.—Sleeping mat (*fala*), serrated edge finish: *a*, commencing on the left with the working pairs of the first triangle (1 to 4), these are lifted up from under the weft ends of the succeeding triangle. In this position, they are dextrals and form a natural working edge at the line where they cease operating. The check technique is continued without any rearrangement and the sinistrals from the next triangle fall naturally into position. *b*, The previous recumbent working pair (2, 4) is raised and with it the top dextral weft (1) is kept up. The first sinistral from the next triangle (1') is placed in the shed and fits in with the check technique of its own plaited triangle. *c*, The top dextral (1) is given a half turn and laid on the course of the sinistral (1'). The raised pair (2, 4) is then crossed over it. *d*, From now on the technique is a repetition of the above movement. With each movement a new dextral is picked up from the right and the top dextral is turned down on the sinistral in the shed prepared with the appearance shown. The ends of the turned-down dextrals may be simply cut off below the furthest crossing wefts or they may be poked under the already plaited crossing wefts on their course and cut off before they reach the free edge of the serration or actually at the serrated edge. (See 1, 2, and 3.) The free ends of the sinistrals may also be cut off at the turned edge of the plaiting (4) or poked through under a few crossing wefts on the body of the plaiting and the end concealed under the last crossing weft (5).

Baby mats. Small mats averaging 38 inches in length and 24 inches in width are made as sleeping mats (*fala lili'i*) for babies. The term *lili'i* (small) applies to the size and also to the narrower wefts but the name of *fala pepe* is now usually used. The Samoan term for "baby" is *pepe*. The technique for ordinary sleeping mats is used, but with more care and variety of stroke. A mother or grandmother demonstrates her regard for the baby by care in the selection of material and skill in the use of the more uncommon forms of decoration and edge finish. The wefts may be as narrow as 0.2 inches. The variety in technique is demonstrated by three such mats in Bishop Museum.

The body is made of double wefts of the somewhat wide width of 0.4 inches. The commencement was made along one of the wide edges and the technical side edges form the shorter ends when in use. The double wefts are turned in at the sides with the typical two half turns described with floor mats. (See fig. 114.) The stroke of the body is check, but at intervals the monotony is relieved by rows of dextral and sinistral twilled twos. About 2.25 inches from the finishing long edge, the double wefts are separated into two layers and each weft element split into two. The plaiting of one layer is continued with the narrower wefts in twilled twos for a depth of 3.5 inches and the plaiting edge finished off with the turned-down dextral and cut-off sinistral technique. (See fig. 117.) The plaiting is continued around the end, when the mat is turned and the other layer of narrow wefts plaited. The two

layers of smaller twilled-two plaiting is continuous at either end of the long edge. When completed, the free edge is folded in for a depth of 1.25 inches and thus concealed between the two layers of plaiting. The long, commencing edge is then dealt with similarly. (See Plate XVII, *B,* 1.)

In Plate XVII, *B,* 3, single element wefts of two differently colored *fala* materials were used, the darker color forming the dextrals and the lighter, the sinistrals. The commencing edge was again one of the long edges and new wefts were added at the side edges. With the two colors, which were not dyed, a geometrical design was worked in twill with combinations of four wefts and then spaced with lines of check forming square boundaries. All the edges were then finished off with the tucked down sinistral edge. (See fig. 118 *d.*) Owing to the use of single element wefts, only one surface could be used as the upper surface.

In Plate XVII, *B,* 2, double wefts in two natural colors were used and differ in arrangement from the previous mat, in having the alternate wefts, both dextral and sinistral, of one color. The commencement was again at one of the long edges. The side edges were formed by the simple half turn, without interlocking. Here, owing to the double wefts having the bright surface outwards, the reversal of surface by the half turns at the side edges made no difference in appearance.

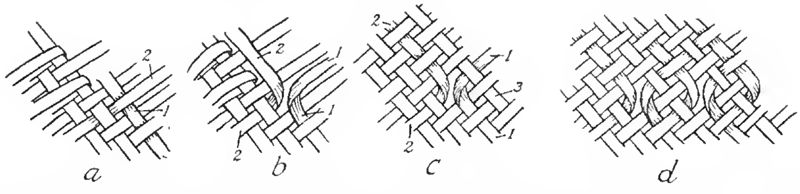


FIGURE 121.—Baby mat (*fala*), open slit ornamentation: *a,* a shed has been prepared for the sinistral (1) and if placed in the usual technique, it would be crossed by the working dextral (2); *b,* instead, however, of the dextral (2) crossing over the working sinistral (1), they exchange functions by each taking a half turn. The dextral (2) takes the position and function of the sinistral (1) and the sinistral by its half turn becomes a dextral and takes the position and function of the dextral (2). *c,* The shed is prepared for the next sinistral (3) and when it is in position and covered, the vertical slit between the half turns of the wefts (1) and (2) is fixed; *d,* the technique is continued with every alternate sinistral and every alternate working dextral at the working edge with the result shown.

The body was plaited throughout in check but so arranged that the two colors were worked into single weft oblique lines arranged to form squares. About an inch from each long edge, a series of narrow open slits were formed by giving two wefts about to cross, a half turn to deflect them away from each other. (See fig. 121.)

The finish of each long edge is by the two-side three-ply braid of permanent food platters. (See figs. 95 and 96.)

In each of the three mats, a different technique has been followed in the plaiting of the body, and the finish of the long and short edges. These small mats are a distinct type created for a specific use and must not be confounded with samplers made for tourists.

RIGHT ANGLED PLAITING

The baby mats described have followed the rule, laid down for plaiting, that both sets of crossing wefts are included at the one commencing edge and thus all wefts run obliquely to all edges. At Fitiuta in Tau, baby mats were observed in which the crossing wefts ran parallel to the side and end edges respectively. One set of wefts commenced at one edge and the crossing wefts all commenced at another edge set at right angles to the first. The disposal and direction of the two sets of plaiting wefts thus resembles that of the warp and wefts in weaving. This form of right angled plaiting has been mentioned in a form of pandanus basket (Pl. XVI, *D*). If the old *tanga* baskets were made with this plait, it is possible that the technique may have been applied to small baby mats, originally without diffusion from a foreign source. Dr. Margaret Mead collected a number of excellent samples of the technique for Bishop Museum (Pl. XVIII, *A*), together with the Samoan terms used. After conversation with her, the technique was recorded, but judgment is reserved as to whether it is original or due to more recent diffusion. The statement of the present old Samoans as to the age of a technique cannot be accepted without reservation in doubtful instances. An examination of reliably old material in other museums, if present, may clear up the doubt that exists. To distinguish the two general techniques, the mats with the orthodox oblique wefts are termed *fa'aalo* and those with the right angled plaiting, *tapito*.

Tapito mats. The commencement is made with unsplit butt strips bearing 5 or 6 wefts. The arrangement is shown in figure 122.

The usual twilled twos in parallel oblique lines (fig. 122 *b*) retains the twilled two technical term of *lalanga lua,* but when arranged to form zigzag lines (Pl. XVIII, *A,* 3), the technique is termed *fa'api'opi'o* (crooked), but the alternate oblique panels of plaiting so obtained are termed *fa'afatuamanga* (Pl. XVIII, *A,* 4.) Geometrical designs (*fa'asumu*) may also be worked. By tilting the work with one corner towards the observer, the technique by which geometrical motives are produced in the orthodox plaiting of *fa'aalo* mats is seen to have been followed in the right angled plaiting of *tapito* mats.

Another decorative effect is obtained in check by using alternate wide wefts unsplit and splitting the other alternates into three narrower wefts. The check plait is made regardless of the width of individual wefts. (See Pl. XVIII, *A,* 2.) Thin strips of *lau'ie* are overlaid on the narrow wefts to add a color contrast. The technique is termed *lalanga atoa* (*atoa,* wide).

The edges of the *tapito* mat are finished off by doubling the wefts that project beyond the marginal wefts round their outer edge back on the under surface and pushing them through under a number of crossing wefts on the body of the plaiting. The two edges with the butt strips are treated in the same way after first splitting the undivided butt strips into their component wefts. Dr. Margaret Mead informed me that a *fa'atala* serrated edge was also formed by plaiting sets of five projecting wefts to a diminishing point.

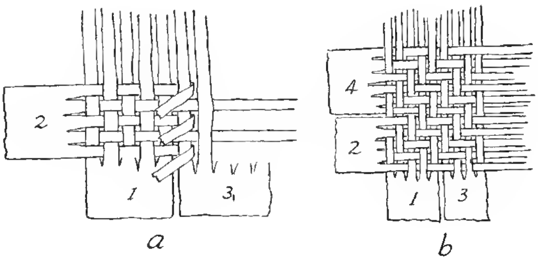


FIGURE 122.—Baby mat (*tapito*) commencement: *a*, check plait. The butt strips (1) and (3) provide the longitudinal wefts which act like sinistrals and the butt strip (2) on the left supplies transverse crossing wefts which are separated into two alternating series with the left hand to act like the dextrals in ordinary plaiting. The separated series of transverse wefts is shown over the left weft from strip 3. Weft-bearing butt strips are added at the bottom to the right of (3) and on the left edge above (2) to obtain the dimensions of the mat. *b*, Twill plait. The addition of wefts is the same as in (*a*). In changing the elements of the pairs to obtain a twill, the lines of twill run obliquely instead of horizontally or vertically as in orthodox plaiting in which the wefts are inclined obliquely from the very commencement.

LAU'IE SLEEPING MATS

Mats made of *lau'ie* are mostly of the fine mat type known as *'ie tonga*. As they are worn as skirts, they are described under clothing. Some not so thin, or as elaborately decorated with red feathers, are used as chief's sleeping mats termed *'ie moenga*.

One donated to Bishop Museum by Tuitele of Leone is 6 feet, 10 inches long and 5 feet, 9 inches wide. The wefts average 13.5 to the inch. Each end has a short fringe of free weft ends. The side edges are formed by the simple half-turn technique. At one end, triangular strips of pandanus have been sewn on near the edge with the points projecting beyond the edge and lying on the fringe. Though no feathers are at present attached, remains of stitches show that it had this form of ornamentation and could be used as an *'ie tonga*. Though the wefts average 13.5 to the inch, it is thicker than the usual fine mat and Tuitele states that it was used as a sleeping mat. The mat, like so many owned by high chiefs, bore a name. The name of the above is *Tautala ma le amonga* (Speak with a burden of food). The idea

conveyed by the name was that the person desirous of speaking to or consulting with the hereditary owner of the mat came bearing a burden of food on a pole (*amonga*). This was deposited outside the house and the bearer or the bearer's employer was privileged to speak (*tautala*) with his high chief. As the speech usually took the form of a request, the burden of food assisted materially in obtaining favorable attention.

DECORATION IN SAMOAN PLAITING

Check. In close check plaiting each weft stroke forms a square with its sides equal to the width of the weft. Without change of color, each square looks the same whether it inclines to the right or the left. The only possibilities of pleasing the eye in this technique are the regularity and fineness of plait obtained by splitting the wefts evenly and getting them as narrow as the material will allow. With objects of ordinary use, utility comes first. Wide wefts are easier to handle and the object is more quickly made. When we pass from floor mats to sleeping mats of the same material, the wefts narrow until they diminish to 0.2 inches. Further advance necessitated a special technique in preparing material to render it possible to obtain narrower wefts. Fine weaving thus reached its highest development in the check technique of fine mats where, owing to the *lau'ie* material being split into two layers, it was possible to split wefts as fine as from one-fourteenth to one-twenty-second of an inch. The aesthetic value of a fine mat is due to narrow wefts, but the technique, though difficult to work with the fingers and trying to the eyes, remains the simple, common check in universal use. In the use of the check, Samoan technique specialized in the direction of increasing the fineness of the weft and the alternate decorative possibilities to be obtained by using change of color was not exploited to any extent.

Twills. With twill strokes, it is possible to get change of appearance with materials of one color. Aesthetic value was not primarly influenced by reducing the weft width as in check, and different patterns appear early in material made with coarse coconut leaflet wefts such as wall screens. Structural decoration due to change in the strokes made with the foundation wefts appears as an early form of decoration.

In joining together two or more coconut leaf midrib strips to provide two distinct sets of crossing wefts, the Samoans found that a commencing line of horizontal twilled twos was the easiest and quickest form of technique. Horizontal lines of twilled twos were continued up on the body and are probably the oldest pattern. Any departure from horizontal lines created a new pattern and a further decorative effect. Vertical lines of twilled twos thus became popular on the wall screens and *laulau* platters as a departure from the common pattern produced by ordinary plaiting.

In the *ola* fish baskets it was easier to continue with the ordinary technique of horizontal twills but in the more pretentious round baskets vertical twills were preferred. Twilled twos also developed into twilled threes, fours, or fives and combined with check or lesser twills as the desire for variety dictated. In coarse floor mats the working check was retained but in sleeping and baby mats the more decorative twills were used. In fine mats the check was retained, as aesthetic value was supplied by the fineness of the plait and a change to twill would have complicated an already difficult technique as regards manipulating the fine wefts. Changes in the direction of the lines of twill led to zigzag patterns termed *fa'api'opi'o* (crooked).

Further advance in structural decoration was made by raising groups of three or more dextrals and altering the order in which they were dropped to cross with a similar number of sinistrals. This has been seen in the wall screens and has become associated with them in name, as *lalanga fa'atalafale* (plaiting like the wall of a house). The geometrical figures produced *mamanu* of *sumu*, names also applied to sennit designs worked on wall posts, beams, and canoes. They are regarded as important forms of decoration. There is pride in the voice of a craftswoman when, as she starts a combination, she says, "Mamanu." Similar pride is expressed by a man when he points out the sennit design on a wall post or beam, and says, "Mamanu." The pride that a Samoan woman takes in the geometrical pattern of a wall screen made out of coconut leaflets shows that she obtains pleasure from the structural decoration which is unassisted by change of color. Hence, when she adopted the geometrical patterns on floor mats where color could have been easily employed, she was so satisfied with the plain structural decoration that Samoan plaiting remained in that stage of decoration and advanced little, if at all, until more recent influences opened up the possibilities of employing colored elements to enhance the appearance of the geometrical motives that had come into use.

Structural geometrical motives. The motives used in the mats examined were the two used in the wall screens with modifications regarding the bounding of them with lines of check or twill, and one other, also probably used on wall screens. (See fig. 123.)

Colored wefts. A restricted use of colored wefts is now in vogue but owing to the satisfaction derived from structural twill decoration in the color of the natural wefts and the high value of fine check plaiting, it is probable that the technique is of fairly recent development. Color contrast may be obtained by using two shades of the weft material or a distinct color from some other material, such as a dye.

The method of using two shades of the same material is the most common and is probably as far as color use went in olden days. The *laufala* has a natural brown shade which gives the general color to all mats. If some of the

material is cooked in an oven and bleached in the sun, it becomes lighter in color and forms a distinct contrast to the darker normal color.

One set of wefts (dextrals) is provided from one shade of material and the crossing elements from the other shade. In check plaiting, a draft board pattern is produced in small squares the width of one weft. In this pattern all the white elements run in one direction and the dark elements in the opposite. In the baby mat described with the longitudinal open slits, the change in direction of two wefts on every third sinistral changed the direction of every alternate dextral and every alternate sinistral. The pattern then changed from colored checks to thin oblique lines running to the right (see Plate XVII, *B*, 2), which were formed by the alternate arrangement of color throughout, resulting in the sinistrals of one shade crossing over the dextrals of the same color. After a sufficient depth of this pattern, the direction of the oblique lines was reversed by plaiting a single horizontal row of sinistral twilled twos. Any twilled two stroke will change the direction of the line. By using twilled twos to change direction and mark the angle of the change consecutive squares may be formed.

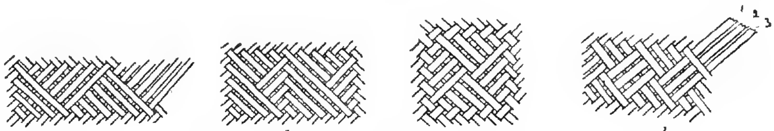


FIGURE 123.—Geometrical motives in plaiting: *a*, this form, though common in wall screens (fig. 88), is not much used in sleeping mats as the longer twilled weft is liable to catch against objects moving over them. *b*, Another common motive of wall screens. (See fig. 89.) *c*, An adaptation of the motive (*b*) to sleeping mats and baby mats, where the four triangles meeting at their apices are bounded by lines of check. *d*, The motive is produced by raising three dextral wefts while three sinistrals are passed beneath them. The motive forms a square set on one corner, with a triangle above and below formed by the sinistrals being crossed by horizontal lines of dextrals. The figure is termed *si'i tolu* (*si'i*, to lift; *tolu*, three). A greater number of wefts may be used when the term *si'i* would require the number used, to qualify it.

The slits that may be regarded as part of the decoration were really used instead of a twill stroke to change the pattern. In twill, the horizontal lines of twill naturally arrange into the different colors of the dextrals and sinistrals. Vertical colored lines and zigzag lines can be arranged by simply following the stroke technique described. It is, however, with the geometrical figures that the two colors are principally used to accentuate the design, as in the baby mat (Plate XVII, *B*, 3, and fig. 123 *c*). Here the lines in twill and check are used as bounding motives to the more elaborate geometrical motive.

The use of the black outer skin from the base of plaintain leaves (*soa'a*) is claimed as old. If so, it is not so extensively used as in the Cook Islands. The outer, black skin of the *soa'a* is stripped off and scraped on the inner surface to make the material as thin as possible. It is then split into wefts

of the same width as the foundation wefts of the mat. In *soa'a* material, the black color is on the outer surface while the inner surface is brown.

The method of using *soa'a* wefts is by overlaying them on the foundation wefts with the black surface upwards. Two methods of overlaying may be used: 1, Structural overlaying consists in laying the *soa'a* element on the sinistral foundation wefts as they function at the working edge. When the working dextrals complete their movement over the sinistral in the shed, the *soa'a* element is fixed on the working sinistral and the parts not covered by the working dextrals which cross over it, show up. Thus each sinistral so treated is black on the upper surface but no color shows on the under surface. Structural overlaying is not much used by the Samoans. The only specimens seen formed horizontal lines of twill. 2, Inserted overlaying is more common than structural overlaying but is little used. The completed structure of the mat is then decorated by pushing single strips of *soa'a* under crossing wefts over the course of selected wefts. Thus in the sleeping mat (Pl. XVII, *C*, 1) zigzag lines in black run close to the serrated edge, while further in, lines are crossed so as to form a series of rectangular figures, tilted on one corner, and merely outlined at their margins.

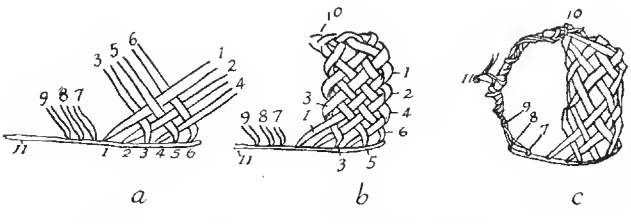


FIGURE 124.—Eye shade technique: *a*, a midrib strip about two feet long is split off from the left side of a coconut leaf and about nine leaflets left at the tip end while the others are stripped off. The six end leaflets (1-6) are plaited in check until all have crossed. *b*, The plaiting is continued by turning in the weft (3) on the left with a half-twist and (4) on the right, in the same way to define the edges while the crossings above or below are dictated by the check plait. As the wefts reach the side margins they are turned in successively with half turns to continue the plaited band which is 5 inches wide. When the band reaches a length of about 13 inches, the plaiting edge is finished off with a three-ply braid as in wall screens. (See fig. 90.) *c*, The three remaining leaflets (7-9) are wrapped spirally around the bare part of the midrib strip (11) which is bent in a curve to meet the end of the braid (10).

The three plies (10) are plaited along the strip in such a way as to include it. At about the middle of the arch formed by the strip (11), the ends of the three plies are knotted around it. The ends of the three leaflets (7-9) which project beyond the first twist of the braid around the strip are doubled back wound spirally around the braid and knotted around it at the middle (11). The arch is passed over the head and the plaited band forms a shade over the eyes. The shade may be fitted during manufacture by placing the plaited band in position, passing the midrib strip around the back of the head and holding it with the thumb at the part where it meets the plaited band. The extra length is cut off at the point marked by the thumb and the arch formed as described.

Though well acquainted with the use of native dyes in coloring bark cloth, dyed pandanus material did not figure much in the craft of mat making. It is doubtful if it did until after the more extensive use of foreign dyes in making kilts for tourists. The stimulus given to dyeing kilt material extended to mat material, not for trade but for their own use. The elaborate mat in Plate XVII, *C*, 2 has all the sinistral wefts dyed with the black native *lama* dye. The same geometrical motive used with the two natural shades (Pl. XVII, *B*, 3) are used here with effect and interspersed with squares worked in twill arranged in four triangular segments (fig. 123 *c*). Though plaited by Samoans with motives that could easily be derived from their own craft, one feels that the idea of such elaboration is as foreign to their own native culture as the colored worsted fringes around the edges. In Samoan plaiting, therefore, the importance and value of the fine mat (*'ie tonga*) directed the attention of craftswomen in the direction of fine check plaiting and restricted the development of other forms of decoration.

EYE SHADES

Eye shades (*taumata*) are plaited with coconut leaflets for the use of bonito fishers to protect their eyes from the glare of the sun. They are roughly and quickly made. (See fig. 124.)

TWINES, CORDS, AND ROPES

MATERIAL

The plants which supply material for cordage are the *fau* or *fau tu* (*Hibiscus tiliaceus*), *fau songa* or *fau olonga* (*Pipturus propinquus*), *mati* or *matiata* (*Ficus sp.*), and the coconut. The bast of the breadfruit (*Artocarpus incisa*) is used for a particular net and sometimes the bast of the paper mulberry. Except the coconut, the inner bark or bast of the plants is used. It readily splits off from the outer bark and for finer lines, it is scraped on a board with a shell to remove the coloring matter and mucilaginous material.

The *fau* grows practically everywhere and supplies the material for ordinary ropes. The whole bark is used in wide strips for tying scaffolding and in narrower strips for other minor purposes, such as tying baskets. For common everyday use the *fau* is invaluable.

The *fau songa* is called *fau olonga* in Manua. In *olonga,* Manua retains the widespread Polynesian name given to various plants that supply the bast material for lines and cords. Stronger than *fau tu,* it does not grow in such quantity and the better fibre is thus restricted to finer cords. After being scraped it is usually braided together (Pl. XVIII, *C*, 1) and rendered whiter by soaking in sea water, rubbing in sand, and bleaching in the sun. The extra labor in getting sufficient quantity prevents its being used to make ropes.

The *matiata* supplies strong fibre in the bast of the long, slender rods which characterise the plant, and is used as cordage for shark nets.

The coconut supplies strong fibres in the husk surrounding the fruit. The large quantity of interfibrous material is separated by a special process. The much-used three-ply braid is made from it as are also the strong ropes.

The *fau* supplies the material for ordinary rough use, *fau songa,* the strong lines and cords not requiring too much in the way of quantity, while, for quantity and strength, coconut husk fibre supplies the *'afa* braid and strong ropes.

TERMINOLOGY

The term "plaiting" has been used so much with cordage that, as a general term, it need not confuse us. There are, however, two distinct methods: twisting and braiding. Twisting again is divided into two forms of technique according to whether the quantity of material used is small or large. For cords and lines, the plies of the cord are twisted around each other on the bare thigh, which process is termed *milo.* Here *milo* refers to both twisting the individual strands or plies separately and then over one another. The one follows the other as a matter of course. In rolling coconut fibre together on the bare thigh, the process stops short at the rolling of the individual strands. They are afterwards braided. The term *milo* could not be applied, so the term *fa'ata'a* is used. In twisted cords and twisted ropes of coconut fibre, the twisting of each ply separately and then over each other was done by hand, the *milo* process on the thigh being unsuitable or impossible. In Tutuila, this process was called *lafo,* though Pratt does not give that meaning.

To twist plies over and under each other, as in braiding, is termed *fili.* Three-ply sennit braid has received the specific name of *'afa* (cf. *kaha* and *'aha*) but it may be further distinguished as *'afa fili-tolu* (*tolu,* three). In braiding, some confusion in terms appears to exist as to cordage with more than three plies. There is no trouble as to the number, which is simply mentioned in the name. The lack of clarity is in the use of the terms *tua* (fold) and *langa* as in *'afa tua lima* and *'afa langa lima.* As *langa* seems to be derived from *lalanga* (to plait a basket or mat), it probably refers to a braid made with the technique of check plaiting, where each ply passes over one and under one, whereas *tua* would refer to the braids made like three ply braid, but where the outside ply crossing over to the middle position may cross over more than one ply. Thus the round four-ply braid is an *'afa langa fa* (*fa,* four) whilst the five-ply braid seen in use is an *'afa tua lima* (*lima,* five). All sennit cords and braids are called *'afa* with a qualifying word. When *'afa* is used alone, a three-ply braid is meant. The two-ply twist is also loosely called *'afa fili lua,* which is not the correct usage of *fili.*

Threads, or fine cords are termed *manoa,* fine lines, *ta'a* and ordinary fish-

ing lines, *afo*. A rope is *maea* and its strands *fu'a*. The word *taura* used in the Maori and Cook Islands dialects for a rope, means an anchor in the Samoan form of *taula*. The term *maea* in Maori means to come to the surface of the water but has not retained that meaning in Samoan. The Maori word for anchor is *punga* which in Samoan is restricted to larger lumps of coral. Archdeacon Williams, in conversation, suggested that the Maori named his anchor from the material *punga* and displaced the term *taura* (*taula*) to the rope which brought it up. The Samoan restricted *punga* to the coral, kept *taula* for the anchor and used *maea* for the rope which caused the anchor to come up to the surface.

THREADS OR FINE CORDS

The finer threads (*manoa*) seen in use were two-ply twists of *fau songa*, used for the finer lashings of fish hooks, headdresses, squid lines, and supporting red feathers.

TWISTED CORDS

Two-ply twisted cords were usually made of *fau songa* by the *milo* process on the bare thigh. The plies were lengthened by adding a fresh strand of material to the shortening ply with an overlap and then rolling them together on the bare thigh before rolling the two plies round each other. The specimen figured (Plate XVIII, *C*, 2) was made for a small fishing net. The cord has not been used in water and the material is between ecru-olive and buffy-olive in color.

Two-ply twisted cords of breadfruit bast were seen in a special type of seine net at Leauvaa in Upolu but had, however, been made at Safune in Savaii. The younger shoots of the variety of breadfruit known as *'ulu manu'a* were used. The bast was scraped on a board in the same way as in preparing paper mulberry bast for bark cloth. The cords were fairly thick but varied in different parts of the net.

SENNIT TWO-PLY CORD

A fine cord (Plate XX, *B*, 1) not quite 2 mm. in diameter was used for such purposes as tying stone sinkers to nets. The two plies could be rubbed together on the bare thigh by the *milo* process but owing to the rough nature of the sennit, it was usually made by twisting the plies with the hands and plaiting towards the body as in ropes, the commencing end being fixed to a post or stake. The fresh strands are usually joined to the shortening ply by simply overlapping the ends.

A coarser two-ply is made by strands rolled together with a binding fibre (*fa'ata'a*) such as are used in three-ply braid. Besides the simple join by direct overlapping, two other methods are used. (See figures 125, 126.) In

both the above figures, the doubling over of the new element is shown passing transversely over the twist. In the actual cord they are hardly distinguishable.

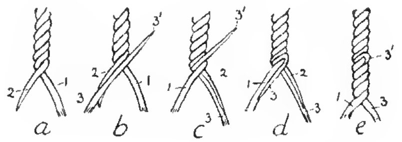


FIGURE 125.—Two-ply cord, joining ply (*so'o*): *a,* the ply (2) is the shortening ply; *b,* the new strand (3) is directly laid over the short ply (2) from below with its short end (3') projecting upwards past the point of joining; *c,* the other ply (1) is twisted around over the reinforced ply (2); *d,* the projecting upper short end (3') is doubled down over the other ply (1); *e,* the twisting is carried on and both the short end (3') of the new strand, and the short ply (2) is buried so to speak in the twists, while the new strand (3) continues the ply (2).

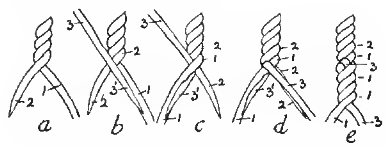


FIGURE 126.—Two-ply cord, alternate join: *a,* the alternative method is exactly the same in result but the opposite in commencement technique. The ply (2) is again the shortening ply. *b,* The new strand (3) is added from above with its short end (3') on the long ply (1); *c,* the ply (1) with the short end (3') is twisted over the short ply (2); *d,* the long end of the new strand (3) is doubled down over the short strand (2); *e,* the twisting is carried on with the same results as in figure 125.

THREE-PLY TWISTED CORDS

Two kinds of three-ply cords are made from the *fau songa* and from *matiata*: *a,* the *ta'a* cord made of *fau songa* is used for the fine lines with the trolling hooks known as *pa ala,* the thicker lines with the bonito hooks (*pa'atu*) and for rod fishing inside the reef (*seuseu*). (See Plate XVIII, *C,* 3, 4, 5.) The three plies are rolled together by the *milo* process on the bare thigh. New strands are added by direct overlapping on the shortening ply and rolling on the thigh. The *fau songa* cords, after use in water have a typical pale neutral gray color. *b,* The name given to the three-ply cord made of *matiata* bast by a Tau man who demonstrated the plaiting was *fatu a fau.* The bast was split off from the epidermis, scraped, and dried in the sun.

Milo process. The bast was divided into appropriate thicknesses and rolled separately on the thigh into strands. Three strands were held between the left forefinger and thumb in such a way that they are slightly spaced apart. Still holding them firmly, they were laid transversely over the right thigh. The right palm towards the base of the fingers was laid over the three

strands and rolled them firmly downwards or away from the body. The first part of the movement rolled each strand firmly on itself into three separate twisted strands during the outward movement, the right palm having worked over the strands to near the wrist. The left hand slacked slightly and the last part of the movement twisted the three strands over each other into a three-ply cord. At the end of the outward sweep, the palm was turned over on its ulnar or outer edge and returned towards the body with a firmer pressure that twists the plies more closely together in the twist already commenced. A few loose twists at the end of the backward roll were untwisted and the left hand shifted down to hold the end of the section that was firmly twisted. The three plies were separated and held thus whilst an outward and backward sweep completed another short section of the three-ply twist. By these short sections, the length required was obtained.

The join in this thickness of three-ply was made by the doubling over method with the new strand added from below (fig. 125), but owing to the *milo* technique being used a slight difference exists as shown in figure 127.

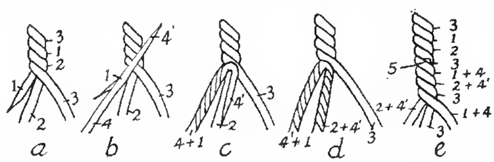


FIGURE 127.—Three-ply twisted cord, join: *a*, ply (1) is the shortening ply; *b*, the new strand (4) is placed over the short ply (1) from below with its short end (4′) projecting upwards beyond the point of joining; *c*, the three plies are held apart by the left hand on the thigh, while the right hand rolls the new strand (4) and the short ply (1) together. The short end (4′) of the new ply is then turned down on the next ply (2); *d*, the ply (2) and the short end (4′) are rolled together on the thigh. To complete the rolling, the ply (3) is also rolled separately; *e*, the three strands are rolled as in the usual *milo* technique. In well-made cord, the join (5) can hardly be seen.

The *matiata* three-ply twist (Plate XVIII, *C*, 7) is 3 mm. in diameter. The extra thickness gave the cord the strength needed for making shark nets which were anchored off the reef.

SENNIT THREE-PLY BRAID

Sennit braid (*'afa*) is the most important single article in Samoan material culture. The quantity used is so great that even in the present period men use much of their spare waking hours in plaiting it. All the actual details of its preparation are thus readily available.

The coconut (*niu*) used is the special large variety known as *niu 'afa* (the sennit coconut). The fruit is about 13 inches long, the husk thick, and the contained nut comparatively small. (See Plate XVIII, *B*, 1.) The phrase applied to it, *fete pulu* (swollen husk), has come to be used for anything large with little in it. Other nuts used were as follows: *niu ui,* with a very

white fibre (*pa'e pa'e*); *niu alava,* with a medium colored fibre; *niu malo,* with a reddish fibre (*mūmū*). When *niu 'afa* can not be obtained, ordinary nuts, (*niu sasa*) are used. The *niu 'afa* is roughly triangular in cross section. The fibres within the husk run longitudinally with the long axis of the nut. The husk is, therefore, prized off in longitudinal sections. (See Plate XVIII, *B,* 2 and 3.) The sections corresponding with the convexities, or rounded angles of the cross section, contain longer and better fibre, and the sections are termed *matai'a.* The intervening sections between the three *matai'a* have shorter fibres and the sections are called *lafalafa.*

The husk of the green nut (*mumu'a*) or the mature nut (*popo*) were alike used. The outer skin of the husk is termed *tua pulu,* the fibres *mui 'a'a,* and the interfibrous material *tae.*

Treatment of husk. The husk is removed in even, longitudinal segments with a *mele'i* husking stake. The object is to separate the interfibrous material from the fibre. The husks of some kinds of nuts, such as the *niu ui,* may be beaten at once, but most of them, including the *niu 'afa,* require soaking in water to soften the interfibrous material. The green husks from *mumu'a* nuts require only 4 or 5 days soaking, but the mature husk of the *popo* requires much longer—three weeks to two or more months. Long soaking does not deteriorate the fibre but, according to the Samoans, rather improves it in strength and lasting qualities. The segments are collected in a coconut leaflet basket, submerged in a pool inside the reef, and weighted down with stones. The submerged basket of husk is termed *taomanga.* After the minimum time of soaking has elapsed, the number of segments required for use are extracted from the *taomanga* and the rest left in the water for future use.

Beating the husk (*sasa pulu*). The inter fibrous material is removed by beating the husk sections, also called *pulu,* on a wooden anvil with a wooden mallet.

The anvil is termed *malaise,* but in Tutuila, *tu'itu'i.* An ordinary log or a rock may be used as a makeshift anvil, but every family usually has a well made anvil cut out of a section of coconut wood. They are thus circular in shape with a flat upper surface and usually four but sometimes three, legs. (See Plate XVIII, *B,* 4.) The legs are cut out of the solid with the anvil and their outer surface is continuous with the outer surface of the anvil. The under surface is not usually horizontal, but slopes downwards and inwards from the circumference to a central point. The lower end of the legs may be square or come to a blunt point. The anvils vary in size with the taste of the maker, but the circumferential legs are a constant feature.

The mallet (*sa'afa*) is an ordinary straight piece of heavy wood, round in section and with one end trimmed down into a handle. No particular care

is devoted to their manufacture. They vary considerably, however, in length and thickness. The beating end is smooth. (See Plate XVIII, *B*, 5.)

The outer skin (*tua pulu*) is readily pealed off and the inner short part of the soaked segment torn off and discarded. Holding one end of the segment with one hand, the other part is beaten on the anvil with the beater, the left hand every now and again turning the segment. The interfibrous material flies off under the blows of the mallet whilst that which does not is loosened and flicked off after every few blows. The ends are reversed and the *sasa* process of beating continued until only the cleaned fibres remain. The interfibrous material has a vile odor which is painfully evident whilst husk beating is going on. Each segment is beaten separately and tied at one end with one of the fibres to keep them distinct, and is called a *matofi*. (See Plate XVIII, *B*, 6.) If water is available, the *matofi* may be washed to assist in removing the smell as well as any particles of interfibrous material. They are then thrown up on the thatch of a roof and left exposed to sun and air to dry and also to complete the removal of the odor. Immediately after beating, the fibre has a beautiful, silky, yellow color, but this changes after exposure to the usual sennit brown. As already pointed out, some fibre has a natural deeper brown or reddish color. The *matofi* may be left out on the roof for some days.

Rolling the strands (*fa'ata'a*). The first part in the braiding process consists of rolling the prepared fibre into suitable strands (*fa'ata'a*). The braider sits down crosslegged in the house with a *matofi* bundle beside him. From it he pulls out a number of fibres sufficient for one strand. The very short fibres (*fungafunga*) are separated from the good fibres, which retain the name of *mui'a'a*, and discarded. The little bunch of *mui'a'a* is held by the left thumb and forefinger whilst some of the fibres are pulled out slightly at each end, not only to lengthen the strand, but to thin the ends for joining purposes. A single fibre is separated, its middle placed against the strand, and one end twisted round it by the right hand. The other end of the single fibre is then doubled back and the strand twirled between the finger and thumb to finish the rolling of the binding fibre. The strand is next rolled on the bare thigh with the right palm. The rolling of two or three strands of other material to form a twisted cord has been described as *milo*. The rolling of the single strands of coconut fibre is termed *fa'ata'a* and the resulting strand is *fa'ata'a*. Here we have the causative *fa'a* combined with *ta'a* (a line), meaning to make as a line. The rolled *fa'ata'a* is laid down beside the worker and the process goes on until a sufficient quantity has been made. When work ceases, the *fa'ata'a* are bundled together and tied round the middle with a single fibre. (See Plate XIX, *A*, 2.) As the heap of rolled strands mounts up, so do the discarded short pieces (*fungafunga*) collect on the mat. Hence

the proverb of separating worthless things from things of value: "Ia auese le fungafunga, 'ae tu'u ai le mui'a'a" (Discard the useless short fibres, but keep the good fibre).

Plaiting. A sufficient number of *fa'ata'a* having been rolled, plaiting (*fili*) commences. In plaiting *'afa* braid, which is not very thick, the plies are held between the left thumb and forefinger with the thumb uppermost and plaiting is directed away from the body. The technique thus consists of pulling whatever strand is in the middle position outwards under a side ply; first on one side, and then on the other. Whilst the right hand pulls the middle ply outwards under, the left thumb rolls the side ply over into the middle position. The left thumb also, by pressure down on the left forefinger, keeps the plies in their relative positions after each twist is made. The plaited part, therefore, passes backward under the thumb towards the body. It is just the free edge of the braiding that protrudes beyond the thumb, but in this and following figures, the thumb is shown well back so as not to obscure the technique. (See figure 128.)

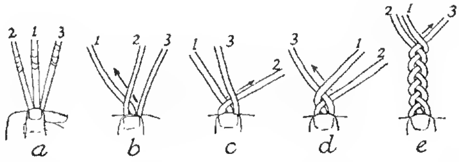


FIGURE 128.—Three-ply sennit braid, plait technique: *a*, each ply is formed by a single *fa'ata'a* strand of which there are three; *b*, the middle ply (1) is pulled outwards by the right hand, under the left ply (2), which brings the ply (2) into the middle position; *c*, the middle ply (2) is pulled outwards under the right ply (3) which brings (3) to the middle position; *d*, the middle ply (3) is pulled outwards to the left under the left ply (1); *e*, the continuation of the above results as shown.

When the *fa'ata'a* rolled strand is added and becomes an actual ply of the plaited braid, it is called an *anga*. Hence anyone asking the number of plies in a braid, says, "Pe fia le malosi o lau 'afa?" (What is the number of the strength of your braid?). The reply comes, "E tolu anga" (Three plies)! Another name for the ply is *tafua*. Some braids have more than three plies. "Ply" is therefore used here to correspond with *anga*, which leaves "strand" clear for material or fresh additions and corresponds to *fa'ata'a*. Thus, a new strand is added to a shortening ply and once incorporated with it after the join, is included in, and becomes, the ply.

The join (*so'onga*). A fresh *fa'ata'a* strand is added to a shortening ply in much the same way as in a twisted cord. The rule is to bring the short ply into the middle position and add the new strand to it with its short end projecting back on the completed work where it is held under the left thumb. Figure 129 shows the process, but in actual practice the thumb keeps just behind the working edge and the completed braid works backward under it.

As the braiding proceeds, the fingers naturally feel the thickness of the plies. If one is felt to be too thin and thus likely to spoil the evenness of the braid, it is reinforced with a fresh strand added in a manner opposite to that of the join above. (See figure 130.)

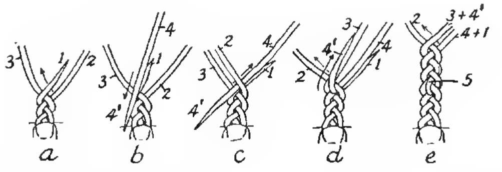


FIGURE 129.—Three-ply sennit braid, join of ply: *a*, the short ply (1) has been worked to the middle position; *b*, the new strand (4) is added to the short ply (1) with its short end (4′) projecting back on the completed work; *c*, the middle ply (1 and 4) is pulled out to the right under the side ply (2) which comes to the middle position; *d*, the ply (2) is pulled out to the left under the side ply (3) when (3) comes to the middle position, the short end (4′) of the new strand (4) is doubled forward on (3); *e*, the braiding goes on in the usual way and only the doubled over short end (5) is seen in the middle line.

The principle of reinforcing a thin ply is to add a new strand from below with its short end on a long ply in the middle position. A couple of turns are made to bring the thin ply into the middle position, when the long end of the new strand is doubled forward to join it.

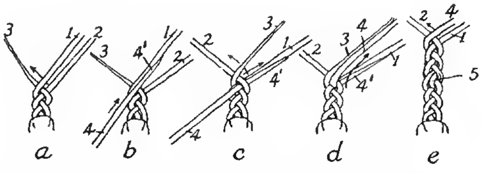


FIGURE 130.—Three-ply sennit braid, reinforcing thin ply: *a*, the ply (3) is too thin and needs reinforcing; *b*, the new strand (4) is added from below to the ply (1) which is in the middle position. The short end (4′) of the new strand rests on (1) while the long end (4) is directed back on the braid. *c*, The middle ply (1) with the short end (4′) is pulled outwards to the right under the side ply (2). After (2) comes into the middle position, it is pulled outwards to the left under the side ply (3) which comes to the middle position. *d*, The middle ply (3) is the one that needs reinforcing. The reinforcing element (4) is therefore doubled forward on (3) and everything is ready to continue the ordinary braiding. *e*, The braiding is continued, (3 and 4) being treated as one ply. The only part of the join seen is the doubled over new strand at (5) in the middle line.

The braiding goes on until the required length is reached. When the supply of rolled strands is used up, the end of the braid is stoppered by rolling the three plies together on the bare thigh with the right hand or by tying the two outer piles together in the first part of a reef knot. A fresh supply of strands is then rolled from the fibers of the *matofi* hank and the braiding continued from where it ended.

At the end of a sitting, the worker measures the braid by holding one end with the left hand and running it through the right as he stretches the arms to full length. The full arm span is called a *ngafa*. The right hand holds the farthest point of the first span and draws it into the left hand which seizes the point. The second span is run through and so on until the number of spans or *ngafa* are counted. To lay by as reserve stock, lengths of one hundred *ngafa* are plaited.

The ordinary three-ply braid described above is used for lashing houses, canoes, and for general purposes. The braid looks loosely made and close inspection reveals two technical details which prevent a neat appearance: 1, the transverse turns of the fibres fixing the individual strands (*fa'ata'a*) show up on the plies of the braid; 2, the overlap of the strand joins (*so'onga*) can be detected. Quickness in manufacture and efficiency in use are, however, the guiding principles in the braiding of this type. The first detail keeps the plies of the strands together and assists quick work in braiding, and the second strengthens the braid which is subjected to firm pulling as it is applied. The average three-ply braid is shown in Plate XX, *B*, 3; a thicker braid in Plate XX, *B*, 4.

A neater braid, though smaller (Pl. XX, *B*, 2) half the size of the average type, is made by rolling the strands on the bare thigh without the addition of a transverse binding fibre, and omitting the doubled-over join. (See fig. 131.)

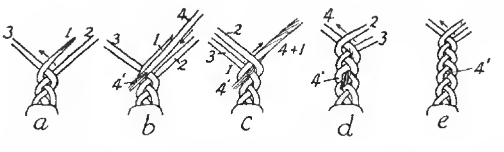


FIGURE 131.—Three-ply sennit braid, simple join: *a*, the shortening ply (1) is worked to the middle position; *b*, the new strand (4) is added from above to the short ply (1) with its short end (4') projecting slightly backwards; *c*, the reinforced middle ply is pulled out to the right under the side ply (2); *d*, the braiding is continued in the usual way and only the tuft of the short end (4') is left projecting in the middle line from under the short ply (1) which was twisted over it in (*c*); *e*, the short end (4') is afterwards trimmed off.

The join. The simple overlap and rolling together on the bare thigh with *fau songa* is not suitable with sennit fibre owing to the stiffness of the material.

The method of joining in fine braids consists, therefore, of bringing the short ply to the middle position and adding the new strand from above with the slightest projection backwards of the short end. The braiding is continued and the short ends in the middle line subsequently trimmed off short. There is thus no overlap to be seen and only the closest scrutiny reveals the cut off ends of the fibres. The same applies to the ends of the short plies. If some of these fibres stick out, they are also trimmed off. It can now be understood that

the extra care and trimming makes the process of braiding slower and is not so suitable for preparing the hundreds of fathoms required for house building.

When the work has not proceeded far, small coils are made on the palm by winding the turns round the thumb and little finger. The coil is removed, pressed together at the middle and bound by passing the working end round it in a couple of half hitches. When the length of braid is too great for this method, it may be coiled round both thighs with the knees diverged as the man sits cross legged on the ground. A third way is to collect the braid in long loops of one span each as the plaiter measures his work. The end of the braid is tied around one part of the circumference of the coil. On recommencing plaiting, the working end is unloosed but the coil kept intact by tying some fibres around it. If a man forgets the length he simply counts the number of the complete turns in the coil which are each a fathom in length. (See Plate XIX, *B*, 2.)

The working material consists of the *matofi* hanks of fibre, a bundle of rolled strands (*fa'ata'a*), and the coil of sennit braid (*'afa*) that is being plaited. Combined, *matofi*, *fa'ata'a*, and *'afa* constitute what is termed a *to'oto'o ali'i* (Plate XIX, *A*, 3) figuratively the staff (*to'oto'o*) of a chief (*ali'i*). As they are combined together for one purpose, they are used figuratively to denote unity of purpose in the saying, "E pei o le to'oto'o ali'i lou finangalo" (May your will be as the working material of sennit braid).

The rolled strands not used up at the end of the sitting, together with the *matofi* hanks, are tied with fibre to the coil or to the working end of the braid so that they will be together and not dropped as the chiefs pay visits and carry their sennit work with them.

Working coil. Carpenters working on a house or a canoe use small coils, (*i'o fanga*), as they are more convenient to work with than large coils or shorter lengths of loose sennit. The coils are made in two ways: *a*, by the simple method when the coil is wound on the palm round the thumb and little finger, pressed together to form an end, and, as close as possible, to the end, a few transverse turns are made with one end of the braid and finished off with one or more half hitches (Plate XIX, *B*, 1); *b*, by the crossed method when the coil is wound on the palm by diagonal turns round the thumb and little finger, carefully removed, and the first end of the braid located lest it be hidden away by subsequent lashing. The coil which forms a figure-of-eight is doubled at the crossing. The crossed end is closely bound with the outer end of the braid and finished off with a half hitch.

In using the coil, the first, or inner, end is pulled out and tied to the object with the running noose commencement or buried under overlapping turns. As the turns of the binding are made, the braid pulls out of the interior of the coil. The coil is easily handled and may be thrown over horizontals when

its weight brings it down to where it is required. The slack is thus kept coiled up and prevents tangling and confusion in the various turns of the lashing.

The making of these working coils is part of the duty of the house owner whilst the building is going on. I saw Misa at Ofu, sitting chatting with the old carpenters in the carpenter's shed, automatically coiling the working hanks from a large coil of a hundred fathoms or more. He went on coiling a continuous series of small hanks which were afterwards separated by cutting or snapping the braid between.

The crossed method gives a shorter more compact hank. It is used nowadays with the very long imported lines used in deep sea fishing. In forming the coil, the line is wound diagonally over the two knees for its full length. The inner end is pulled out and the hooks and sinker attached to it. The line is then payed out until it touches bottom and the extra line remains coiled. The coil is called *i'o fanga* (from *i'o,* coil, and *fanga,* to pull out).

Permanent coils are those made to be stored away for future use. Each householder plaits continually in his spare time to lay up a reserve stock. The coils are then wrapped up in mats or baskets as a *ta'ui* bundle and stored on the *fata* shelves of the house. No one would think of plaiting sennit only when immediately needed. The permanent coils form part of the household property and wealth. The different forms of coils are as follows:

Loose coils (*fanganga*). The ordinary coil in fathom loops is used for shorter lengths in small tasks. (See Plate XIX, *B,* 2.) They save the necessity of breaking into the longer coils and thus spoiling them. They are also useful for satisfying people who come to borrow, and thus saving the larger coils which are kept concealed in their wrapping.

Ball (*'afa tangai*). The sennit is wound around a stick or some folded lengths of bark cloth into a round ball. Synonymous with *tangai* is *ta'ai,* to wind round.

Ornamented ball (*'afa fa'aulu po'o,* or *afa manu lapotopoto*). A ball is coiled to form a regular geometrical design on its surface. Some longitudinal lengths are first folded and the braid wound round the middle part to commence the ball. In the second name, *manu* means the sennit design and *lapotopoto,* globular. One of the longitudinal turns is usually prolonged to form a loop by which the ball may be hung up.

Cylindrical coil (*'afa mamanu,* or *'afa manu fa'aso'a*). The cylindrical coil is the best and commonest form for a large quantity of sennit. (See figure 132.) In the name *'afa mamanu,* we again have the geometrical design (*manu*), whilst in *manu fa'aso'a,* besides the *manu* design, attention is drawn to the cylindrical shape which resembles the collar beams (*so'a*) of a house.

The coil figured in Plate XIX, *B,* 3, shows the appearance, but some coils are much larger than this. It can thus be readily realized why the house-

holder had a shorter looser coil of the *'afa tanganga* type to give away to borrowers to save his more elaborate *'afa manu fa'aso'a.*

The method of coiling (fig. 132) has been adopted by higher cultures for commercial purposes in coiling string. A piece of cardboard curved into a cylinder or truncated cone, takes the place of the longitudinal folds of sennit and in the example examined the ascending spiral turns were laid along the upper side of the preceding turns and the descending turns followed on the lower side of the preceding turns.

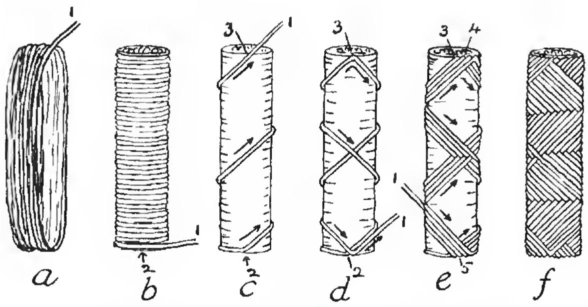


FIGURE 132.—Sennit coil technique (*'afa mamanu*): *a,* a coil is made which when flattened out will be the desired length of the cylindrical coil; *b,* the end of the braid (1) from the coil (*a*) is wound transversely around the coil to form the basis of the cylinder with the free end (1) ending at the bottom; *c,* from the mid-front (2) at the lower end of the surface facing the coiler, the braid is turned up at an angle of about 45° and wound spirally around the cylinder until it reaches the top edge at (3); *d,* the braid is turned down at right angles to its previous course and wound spirally around the cylinder in the opposite direction as shown by the arrows. On arriving at the lower end, it crosses over the commencement of the ascending spiral at (2) to reach the edge. It is then turned upwards to follow the ascending spiral on its lower side. *e,* The second ascending spiral turn reaches the upper edge at (4) where it crosses the commencement of the descending spiral from the turn (3). The braid is turned down from the edge at (4) and follows the descending spiral on its upper side until it reaches the lower edge at (5) when it is turned upwards to follow on the lower side of the previous ascending spiral turn. *f,* The technique is now established. The ascending turns follow on the lower side of the previous ascending turns, are turned at the upper edge to descend on the upper side of the previous descending turn, and at the lower edge change direction to ascend again on the under side of the previous ascending turn.

The technique is continued until the whole surface is covered. Care must be taken to bring each turn to the edge so that an even upper and lower edge is maintained. Each subsequent turn fixes the preceding one. As one complete layer of spiral turns is formed, the winding simply continues. The geometrical pattern develops itself and the triangular figures show up in the actual coil better than in the figure, owing to the standing out of the overlapping last layer.

In addition to the types of coils, sennit braid may be simply wrapped up in a mat without elaborate coiling. Old sennit removed from dismantled houses was so treated and stored on the *fata* shelves. It was then called a *ta'ui 'afa* from being bundled in a mat to form a *ta'ui.* If merely put in a basket, it is termed *'ato 'afa* (basket of sennit braid).

FOUR-PLY ROUND SENNIT

A four-ply round plait seen at Asau was used in a fishing line and besides being called by the descriptive name of *'afa langa fa* (sennit of four plaits) was locally referred to as *fili anufe* from its roundness resembling a worm or caterpillar (*anufe*). (See Plate XX, *B*, 5.) Many Samoans seem to have forgotten the four-ply plait.

The technique is really a check plait on the round. The rolling of fibres into strands and the joins are the same as in the neater three-ply braids. (See figure 133.)

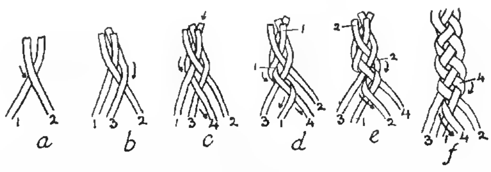


FIGURE 133.—Four-ply round braid (*fili anufe*): *a*, two plies (1 and 2) are crossed (2) coming from the left being crossed above (1); *b*, a third-ply (3) is brought from the right and crossed over the nearer weft (2); *c*, a fourth ply (4) is brought in from the opposite side (left) passing under the outside ply (1) and over the nearer ply (3), as if making a check plait. The principle may now be stated. The outside ply of alternate sides is brought around the back in the opposite direction to the last ply that came in. It passes under the outermost ply on its incoming side and passes over the near ply of the remaining pair. *d*, The outside ply (1) on the left (*c*) is turned around the back to the right, passes under the outside ply (2) and over the nearer ply (4) of the remaining pair. *e*, The outside ply (2) on the right (see *d*) is turned round the back to the left, passes under the outer ply (3) and over the nearer ply (1) of the remaining pair. *f*, The next movement will be with the ply (3). By alternately passing to either side, the round plait is continued as shown.

FOUR-PLY BRAID

Another four-ply braid (*'afa tua fa*) is made by fixing one end and working towards the body, as it is easier with this technique to take the outside plies and work them over to the middle. A four-ply resembles a three-ply braid except that on one side, the outer ply passes over one ply to the middle whilst on the other side, the outer ply passes over two plies. (See figure 134.)

FIVE-PLY BRAID

Five-ply sennit braid (*'afa tua lima*) is made for hand trolling lines and other purposes where fine braid is needed. Some braids are thin and finely made (Plate XX, *B*, 6), others thicker and stronger (Plate XX, *B*, 7). The technique is again similar to that used in making three-ply, except that the outer ply from either side crosses two plies, instead of one, in passing over to the middle position. (See figure 135.)

A five-ply braid made from *fau songa* is shown in Plate XVIII, *C*, 6. The specimen figured is reported from Samoa but I did not see any in use.

In Tonga this type of thicker braid is used with the trolling hooks which are larger than bonito hooks. In Samoa, large trolling hooks (*fa tangi*) were used and it is presumed that the *fau songa* braid was used with them. Five-ply braids are thicker at the sides than in the middle.

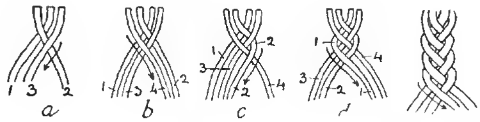


FIGURE 134.—Four-ply braid: *a*, ply (2) is crossed over (1) and ply (3) coming in from the right crosses over (2); *b*, a fourth ply (4) is crossed over from the left; *c*, the outside ply on the right (2) is crossed to the middle by passing over ply 4; *d*, the outside ply (1) is crossed over the two plies (3 and 2) to the middle. This establishes the technique. The outside ply on the right crosses over one ply to the middle while the outside ply on the left crosses over two plies. This is done alternately. *e*, The continuation results in the appearance shown. The appearance is very like three-ply braid except that on one side the braid is slightly wider from the mesial crossings owing to the elements crossing two plies. The middle position has been referred to and while not strictly accurate, the sense is obvious.

ROPES

Two-ply twist (*maea fu'a lua*). Rough ropes of fau bast are quickly made. Little attention is paid to straggly ends. (See Plate XX, *A*, 1.) New strands are added by doubling down the short end on the other ply as in the sennit two-ply cord. The joins are easily detected from the wide strip of bast showing the change of direction where they cross to the other ply. No extra scraping is devoted to the material. The individual plies are twisted to the right and then crossed over the other ply from above downwards and to the left.

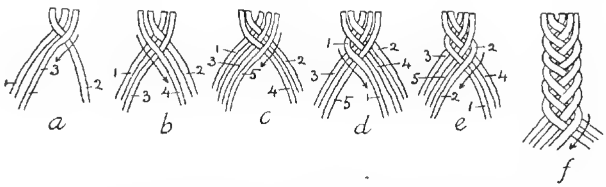


FIGURE 135.—Five-ply braid: *a*, three plies are shown as in commencing a three-ply braid where 3 comes in from the right; *b*, four plies are shown as in four-ply braid where the last one (4) comes in from the other side on the left; *c*, a fifth ply (5) is now added of necessity from the right and it crosses *over* the two plies (2 and 4). The plies are now set up for braiding. *d*, As the three plies in (*c*) are on the left, the outside ply on the left (1) is crossed over the other two (3 and 5) to the middle position; *e*, the three plies in (*d*) are on the right. The outside ply on the right (2) is crossed over the other two (4 and 1) to the middle position. *f*, The alternate crossing of the outside ply of three to the middle position results in the development of the braid.

A better rope is made by scraping the bast more thoroughly and plaiting with a tighter twist. (See Plate XX, *A*, 2.) The new strands are added by

overlapping on one ply and twisting them together without doubling the short end over on the other ply. The particular rope figured had been soaked in a yellow solution evidently of turmeric root.

The better two-ply ropes were used in the house as lines between the walls on which to suspend dividing curtains or mosquito curtains. In Tutuila, the term for twisting the plies together was given as *lafo* to distinguish it from the *milo* and *fili* processes.

Three-ply braid (*maca fili tolu*). A fairly thick three-ply braid rope is made from fibre in the same way as three-ply *'afa* except that the end is tied to a stake or coiled round the big toe. The plaiting is therefore towards the body and the outside plies are brought over the middle ply to take its position. Thicker strands of *fa'ata'a* are rolled to the size required for a ply. The simple overlapping join is used in adding new strands as well as the doubled over join. A rope seen in the plaiting process in Savaii was for the purpose of making a trap to catch wild pigs.

Three-ply twisted ropes. Three-ply twisted ropes were stated not to have been made of *fau* bast. In the Cook Islands, three-ply twisted ropes of this material (*fau*) were regarded as the strongest ropes and, in their mythology, was the type of rope used by Maui in snaring the sun. In Samoa, when extra strength was required, the material used was coconut fibre.

A three-ply twisted rope now in common use in Samoa (Plate XX, *A*, 3) is, however, of foreign make and material but is shown as it is now used in making the shark nooses still in common use.

Shark rope. The proper Samoan shark rope (*maea noa malie*) is a three-ply twisted rope in which each ply is formed of a number of strands of the common three-ply braid (*'afa*). Ripley of Leone stated that as many as nine strands were used in each ply. Five fathoms of untwisted sennit braid will make 4.25 fathoms of rope. Half the total number of strands required, but of twice the length, are doubled at the middle. A space is left at the looped end to form the eye for a loop and a stick is passed through. The stick is suspended and lashed against a beam so that it will not rotate. The strands are lashed together with a piece of cord beneath the stick. The strands are divided into three equal parts to form plies. Each ply thus formed is taken charge of by an assistant who ties a short cross stick to the lower end of his ply. The chief rope maker uses a mature, dry, unhusked coconut (*popo*) with three longitudinal grooves cut to correspond with the plies. This is inserted under the plies close to the upper binding around the strands. The three assistants then twist their sticks in the same direction so as to twist the strands of their respective plies. As the plies become closely twisted, they are allowed to twist around each other to form the rope. The chief rope maker manipulates the coconut husk gage by moving it downwards as the assistants walk around in

the same direction. The process is continued until the rope is completed. The three-ply twist makes a very strong rope that will hold any shark. The further treatment to form a noose is dealt with on page 422.

Three-ply composite braid (*'afa'afalua*). A composite three-ply braid rope is made of a number of strands of ordinary three-ply braid. One rope in Bishop Museum contains three strands in each ply; another, Plate XX, *A*, 4, started with three, four, and five strands, but finished with four strands in each ply.

In these ropes, the old braid from dismantled houses was used over again. Short lengths could thus be economically used and as a particular strand in a ply shortened, a fresh piece was added by doubling over the short end in another ply. The rope, therefore, looked somewhat untidy, but was very strong. These ropes are used in lashing houses during heavy storms of wind.

Five-ply braid rope (*maea tua lima*). The five-ply braid rope (Plate XX, *A*, 5) is made in the same way as the five-ply braid illustrated in figure 135. The strands of coconut fibre are not rolled with individual binding fibres and the joins are by the simple overlapping of ends on the one ply. The rope besides being very strong is neat in appearance and finish. These ropes were seen in use as the bottom rope of large nets and the line for shark bait floats.

PLAITING CUSTOMS

Plaiting is essentially a woman's craft and women plaited everything descibed except—according to my Fitiuta informant—the breadfruit cover (*pulou 'ulu*). Males, however, plaited certain articles without lowering their sex status. The articles plaited by men, in addition to the special breadfruit cover, were the two rough forms of coconut leaf basket (*'ato*) the coconut leaf thatch sheet, and the ridge sheet, the reason being that it was convenient for them to do so. The *'ato fil tasi* and its later variant the *'ato fili tolu* were both used by men to carry food from the plantations on a carrying pole. When no women were about, it was easier for them to cut a leaf from a neighboring palm and make a basket for themselves in a few minutes than to seek out a woman and so waste time. The basket and the pole belonged to men whilst the women more commonly used the carrying sheet strapped to the back. The young men did the cooking and it was convenient for them to plait the basket now termed *'ato fu'e umu* to carry the cooked food from the oven to the dwelling or guest house.

House building was a male craft and it was convenient for men to plait the coconut leaf thatch sheet and the ridging sheet. They were often called upon to make them for emergency shelters. The making of the more tedious sugar cane leaf sheets they left, however, entirely to women. Thus articles likely to crop up in emergency were also plaited by men.

The fashioning of wall screens, food platters, and fish baskets required more skill and was left to women. The plaiting of the coconut leaf floor mat and all work in pandanus material belonged to women. The line was created by convenience and usage. There were no tapus to prevent men from plaiting other articles besides those mentioned. If they did, however, their own sex would regard them as effeminate or ask if he had no wife or female relatives. The plaiting of all forms of cordage was essentially the task of men.

Plaiting parties. Floor mats to furnish a guest house were sometimes made by a working bee of the unmarried women (*aualuma*) who congregated in a house which, for the period of working, was termed a *fale lalanga* (house for plaiting) from its use. The chief for whom the mats were made fed the laborers.

Begging parties. The alternative to the *fale lalanga* custom of making the mats locally is the *tu'u papa,* or *tu'u fala* custom of a chief accompanied by his talking chief and taupou visiting another village and obtaining the required quota by a levy on the various families. (See page 75.)

Braiding sennit. Attention is again drawn to the remarkable persistence of sennit braiding through its having been elevated to a chiefly custom for filling in time whilst making ordinary social visits, or attending meetings and even important fonos held in guest houses. The status of the occupation was recognized by terming the braiding material a chief's staff (*to'oto'o ali'i*) and incorporating it in the proverb already quoted. In marked contrast to the persistence of three-ply braiding is the rapid disappearance of the technique of other forms of braiding, such as the four-ply round and the five-ply flat. The person from whom the five-ply braid rope was obtained could not tell how it was made. The rope was carried round Savaii and the many older men asked could not supply the information. At last a chief from inland Aopo demonstrated the very simple technique which is merely a variation of three ply. Not the difficulty, but lack of use had caused the technique to be forgotten. If nails ever supersede sennit in Samoan house construction, it will be difficult for the old men to keep awake during their meetings.

CLOTHING

The term used for a garment is *'ofu*. Pratt (23, p. 52) states it is derived from *'ofu*, the wrapping of food in leaves. The term *'ofu* is now used to denote garments of foreign material as is also *'ie* which originally signified a garment commenced with a plaiting technique.

The garment for everyday wear was formerly the *titi* kilt made of ti (*Cordyline*) leaves. Early voyagers and missionaries confirm the statement of present day Samoans that it was the only garment worn during the day.

On ceremonial occasions, a greater variety of garments were used which accorded with the rank and status of the wearers. For dances, besides the use of colored ti leaves, simple kilts were made of pandanus leaves and strips of *fau* and *fanga i'o* bast. With *fau* bast, the strips suspended from waist cords were also plaited.

A higher development with *fau* bast, were the short kilts (*'ie*) with hanging fringes that were commenced by plaiting. These again developed into the roughly rectangular garments (*'ie fau*) with a fine plait and an outer covering of tags. The same technique with the bast of the *fau pata* produced the white shaggy garments (*'ie sina*). The fine mats made of narrow widths of pandanus and most valued of all, were the *'ie tonga*. All the types of *'ie* were worn as kilts or skirts and were the special garments of the higher classes on ceremonial occasions.

Bark cloth (*siapo*) provided change garments for the evenings or was worn by women of higher rank. It was also used for wraps and other purposes besides clothing, but it never took the place of ti leaf kilts as an ordinary garment.

KILTS

The term *titi* as applied to kilts is a reduplication of ti (*Cordyline*) from the leaves of which the kilt was made. The meaning has broadened out from actual material to the idea of a number of vertical elements suspended from cords tied round the waist. With other material than ti, qualifying words are used. Kilts made of *fau* and *fangai'o* bast become *titi fau* and *titi fangai'o*. The term *titi*, by itself, means a kilt of ti, but to make it perfectly clear when speaking of different kinds, it is a *titi lauti*. Here *lau* (leaf) is introduced before ti to prevent such an awkward combination as *titi ti*. The more modern dance ornament of strings of feathers hanging from a waist cord receives the name of *titi 'ula*, from the red feathers (*'ula*) which formed the original material.

Kilts may be conveniently grouped into the two classes of *titi* and *'ie*. In all *titi*, the strips are first attached to a braid or cords which form the waist attachment. Some types may be plaited afterwards. The *'ie* commence with the plaiting technique and the waist attachment comes last.

Kilts of Cordyline leaf (*titi lauti*). Different varieties of ti are recognized, such as:

Ti fonua or ti vai, with long wide leaves.
Ti tongotongo, with darker leaves and reddish tips.
Ti 'ula, with red leaves.
Ti fangasa.
Ti tonga.
Ti talo.
Ti usi, a bush variety with long narrow leaves.
Ti vao, a bush variety, with short wide leaves.
The first four varieties are those principally used for kilts.

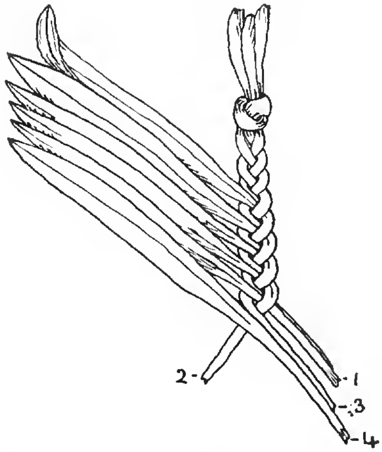


FIGURE 136.—Cordyline leaf kilt, three-ply braid commencement (*fili*). The figure shows the position in actual work. The knotted end of the braid is held between the toes and the butt ends of the leaves are added on the left after the back ply on the left has twisted over the middle position in the braid. Thus, ply (3) has just passed over (2) to the middle. The leaf (4) is placed on the middle ply (3) and the right ply (1) will cross over it to the middle position. The back ply (2) on the left will cross to the middle, and the next leaf will be placed on it. The butt ends of the leaves are incorporated with their respective plies and plaited into the braid as integral parts of the plies. When the kilt formed by adding the leaves is sufficiently wide, the braid is knotted with an overhand knot.

The *ti fonua,* from the size of its leaves, provided the kilt for everyday wear. It was also used as a wrapping for food to form *'ofu.* Hence the connection of *'ofu* with the commonest garments as pointed out by Pratt (23, p. 52). Both *ti tongotongo* and *ti fangasa* were used for dance kilts owing to their color. The *ti'ula* was better still and was worn by the village maid and the young chiefs at village festivals. The ti was planted near the village and about the houses. Hence the saying:

Toto sou ti, toto sou tolo,	Plant your *Cordyline,* plant your sugar cane,
Tatou ta'alolo, ua i'u le fono.	Let us dance, the Council meeting is over.

The ti grows in clumps and there are always some leaf heads that can be used. Hence another saying: "E fa'apupu a ti e le ngase" (A clump of ti will not die).

The green, growing leaves are *ti usi* and those that are turning yellow and have fallen to the ground are *ti pala'au.* The golden-colored leaves are used to form anklets and armlets or a garland for the head (*ti palea*).

The base ends of suitable green leaves are pinched through with the thumb nail or cut and this portion with the stalk (*'au*) removed. The leaves may be plaited whole or split (*tosi*) with the thumb nail in such a way as to leave them connected together at the base with an unsplit portion.

The commencement of the usual kilt is with a three-ply braid (*fili*). The braiding may be done with the butt ends of the leaves alone or three strips of *fau* bast may be knotted and commence the three-ply braid as in figure 136. The latter is the neater commencement as it provides a cord at the commencement end for tying, though a piece of bast can readily be tied to this end afterwards. The braid connecting the leaves together, serves as the waist band of the kilt. The length to which it is plaited depends on the type of kilt required. The *titi lauti* fall into two types, the narrow and the wide: *a,* the narrow kilt (*titi fa'ale'a'u*) was designed to provide the cover demanded by modesty without unnecessarily concealing the figure. It was practically a narrow apron, used in various dances but especially in the almost naked *poula* dance at night. By using this form, the village maid revealed the perfections of her well made figure and the young chief (manaia) enabled the designs of his tattooing to be fully admired. Before important functions, portions of the young chief's tattooing were gone over again with a tattooing instrument and pigment to darken it and thus show it up more. The term *'a'u* means to surround or to meet as with the ends of a wide kilt. By using the negative *le, titi fa'ale'a'u* means a kilt made not to meet. Early writers state that the narrow kilt was also worn by men as an ordinary garment. *b,* In the wide kilt (*titi fa'atuso'o*) more leaf strips were added to the plaited band until the hanging strips completely surrounded the waist when the ends were brought together. From *so'o,* to join, the name *titi fa'atuso'o* means a kilt made to join at the ends. The garment was always worn by women on ordinary occasions and by men as an alternative to the narrow kilt. The term *sulu* is to fasten on a kilt and *sulunga titi* is the part which is fastened. Women fastened it over the right hip, and men fastened it behind. Women preferred longer strips of material for their kilts so that they resembled skirts rather

than kilts. From the long hanging strips, they received the additional name of *taunga loloa*. Hence a woman's long deep kilt received the name of *titi lauti,* from the kind of material, *titi fa'atuso'o,* from the technique, and *taunga loloa,* from the length of the hanging strips.

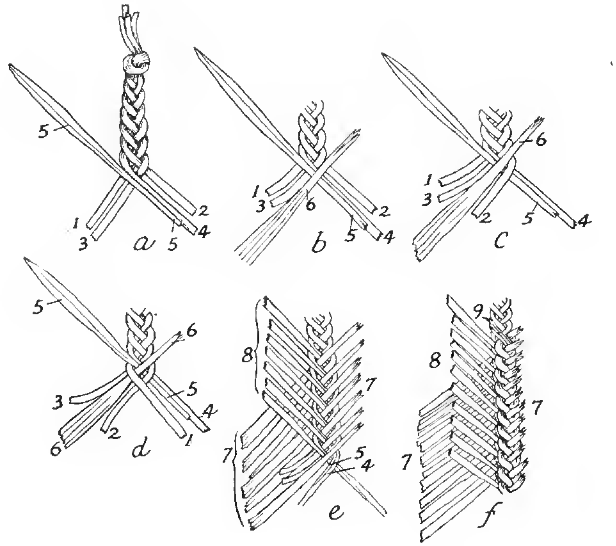


FIGURE 137.—Cordyline leaf kilt, four-ply braid, double layer: *a*, the back-ply (4) has just crossed from the left side so the ti leaf (5) is added to it which forms the first layer element with the butt end sloping towards the plaiter; *b*, an element of the second layer (6) is now crossed over the first and the butt slopes away from the plaiter; *c*, the back-ply on the right (2) is now crossed to the middle and in doing so crosses over the ply (4) and the butt end of the first layer leaf (5); *d*, the back-ply on the left (1) is in turn crossed to the middle, crosses the two plies (3 and 2) and also the butt of second layer leaf (6); *e*, the technique is now established and after every twist made by the back ply on the left to the middle a fresh leaf is added to it in the same oblique direction and immediately after crossed with a second at right angles. When the back ply from the right comes into the middle position, it brings with it the butt end of the leaves of the first layer as (5) with the ply (4). The butt ends of the first layer are thus incorporated with the plies upon which they are placed. The butt ends of the second layer as they cross in the opposite direction are left projecting beyond the right edge of the braid (7). Each leaf of the second layer is also crossed by two plies from the left. [Thus in (*d*) the leaf (6) has been crossed by the ply (1) and in the next movement from the left it will also be crossed by the ply (3).] The first layer is shown by (8) and the second layer by (7). The plaiting proceeds in this manner until the length required is reached. The free braid is continued for a little distance and knotted. *f*, The butt ends of the second layer (7) are dealt with by twisting each tuft around the base of the one in front of it. In the figure the twisting commences at the bottom, passes to the left or strip side of the tuft in front, and is turned to the right or free edge of the braid. The next tuft as it follows suit, fastens down the free end of the previous tuft. The last or top tuft (9) is crossed over the previous one and fixed by pushing it between the strands of the braid. Figure *f* is shown in that position to enable it to be compared with (*e*), but in actual technique it would be turned upside down to enable the twisting to be done towards the worker. The twisting adds decorative effect to the waist band.

Some kilts are made very thick by using two layers of leaves attached in opposite directions at the band in order to balance the oblique direction as they enter the braid. (See Plate XXI, *A*.)

The foundation of the waist band is four strips of bast plaited into a braid as in figure 137. Here the back-ply from the left crosses two plies and the ti leaves are added to the plies crossing from the left.

Kilts were also named after the variety of ti used; as, *titi fonua, titi tongotongo,* and *titi 'ula*. The *titi 'ula* of the red variety of ti was also called *lauti 'ula* (red ti leaves) to distinguish it from the feather *titi 'ula*. They were fringed for dancing, hence the saying as applied to the equipment for the dance: "Le fonga tele ma le lauti 'ula" (The big top knot of hair and the red ti leaf kilt).

The ordinary wearing ti leaf kilt lasted only a day or two. It was part of the women's duties to plait a new kilt for the menfolk, ready to put on in the morning. It is the kilt of green leaves that is meant by the name *titi lauti*. When dried and withered, it was called a *titi pa'upa'u* or *titi mangumangu,* both adjectives meaning dry. The discarded dry *titi* were often used by old men whilst weeding amongst the stones of the platform or loosely paved areas surrounding the houses. They sat on the ground and moved forward by sliding in the sitting position instead of rising. The sliding movement is called *se'ese'e* and the cast off kilts used in weeding thus received the additional name of *titi se'ese'e*. Hence when anyone attempts to make use of a person to do unpleasant work, the following saying is quoted: "A fai ea a'u mou titi se'ese'e" (Do you wish to use me as an old dry weeding kilt).

The dance kilts are sometimes dyed black when they are termed *titi pala, tualua,* or *pa'anga*.

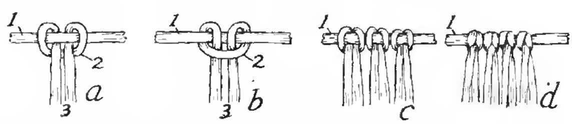


FIGURE 138.—Kilt of *fau* bast, single cord attachment (*fatu*): *a,* one end of the cord (1) is fixed usually by tying to the big toe, long strips of bast are doubled at the middle and the loop (2) so formed is passed under the cord and then brought forward over it, and the finger is then passed down through the loop and pulls the two strands (3) of bast up through it; *b,* back view in which the loop (2) is drawn taut; *c,* others are added; *d,* pulling them extra taut the suspensory cord is concealed.

The chief's name for a ti leaf kilt is *salinga, savalinga,* or *nau*. Pratt (23, p. 224) states that the district of Matautu, Savaii, used the name *noa*. He also gives *fusiua* as a general name.

The kilts of fau bast (*titi fau*) differ from the ti leaf kilt in not having the braid commencement (*fili*). The long strips of bast are attached to one or two horizontal cords, the ends of which are used to tie the garment

around the waist. The method of attaching the *fau* strips to the cord is termed *fatu*. In technique, the *fau* kilt is termed *titi fatu* to distinguish it from the braided kilt (*titi fili*). The method of attaching the strips differs in the single and the paired waist cords. The waist cords may be two-ply twisted strips of bast or a single thick strip twisted on itself to form a round cord.

With the single cord attachment, the method is exactly the same as in making a kava strainer. (See fig. 138.) The two-cord attachment is shown in figure 139.

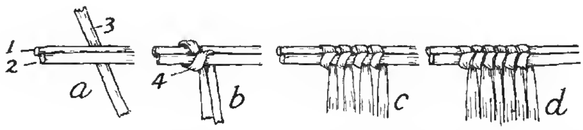


FIGURE 139.—Kilt of *fau* bast, two cord attachment (*fatu*) : *a*, the two waist cords (1, 2) are fixed at one end and held horizontally side by side, then a strip of bast (3) is held transversely below the cords at its middle; *b*, the bast strip is double up around the outer sides of the two cords and both parts passed down between the cords to the right of the lower loop (4) formed and the loop drawn taut; *c*, other strips are added successively in the same manner on the right; *d*, by pulling the loops taut and pushing each added strip close to the preceding strip on the left, the two suspensory cords are concealed.

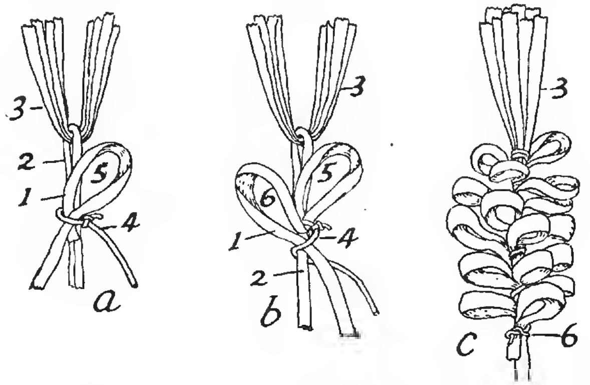


FIGURE 140.—The *fanga i'o* kilt, loop ornamentation (*fatu fa'afeti'i*) : *a*, a long strip of thin bast (1) about 0.4 inch wide has one end placed against the vertical strand (2) just below the tuft (3). Holding the end against the strand with the left thumb, the right hand forms a loop about 0.75 inch long with the strip. The strip, after forming the loop, is laid against the strand over its own end and the completed loop is held against the strand by the left thumb. The base of the loop is then tied to the strand with a thin strip of bast (4). The first loop (5) is thus formed with the strip (1) against the strand (2). *b*, The strip (1) is looped up again and the bast brought back to the strand (2) below the first loop (5). The cord (4) is wound around the looping strip and the strand to fix the second loop (6). *c*, In this manner by means of the continuous strip (1) and the continuous cord (4) wound spirally around the strand and the base of each successive loop, the loops are added to the strand for from 5 to 6 inches of its length. The loops work spirally around the strand and form clusters close together. The last loop is tied to the strand with the end (6) of the spiral cord. The required number are made ere going on to the waist band.

The attachment of strips is continued toward the right until the kilt is long enough to pass round the waist. The completed kilts thus consist merely of strips of bast hanging from a single or double cord and constitute the true *titi fau.*

The kilt figured in Plate XXI, *B,* is unusually long and has been colored yellow in a solution of turmeric root (*ango*).

Kilts of fangai'o bast. The bast of the *fangai'o* splits readily into very thin layers which have a fine, lacelike appearance from the open texture of the fibres. A particular looped ornamentation is made with this material to form hanging strips for dancing kilts. (See Plate XXI, *C.*)

The hanging strips end below in a tuft of long strips. The tufts are fastened to a vertical strand either by tying them at one end or looping the strand round the middle of the strip forming the tuft. The vertical strand serves as the basis for attaching the loop. The loop technique is termed *fatu fa'afeti'i.* (See fig. 140.)

The waistband commences with three fairly thick strands of *fangai'o* bast plaited into a braid. After plaiting for a few inches, a loop ornamentation is introduced into the braid. (See figure 141.)

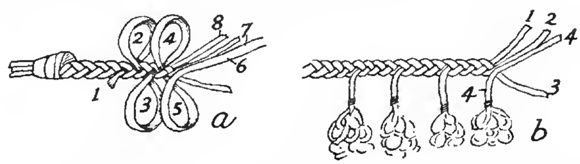


FIGURE 141.—The *fangai'o* kilt, three-ply braid technique: *a*, a thin strip of *fangai'o* bast about 0.25 inch wide has one end (1) laid over the middle ply of the braid and is crossed by the next ply. The long end of the strip is now on the upper side. When the next ply from the upper side is brought to the middle, the strip makes a loop (2) and joins it. Both are crossed by the next ply. The next loop (3) is made on the lower side and comes in with the middle ply from that side. In this manner, loops are formed alternately on either side of the braid. In the loop (5), the strip (6) is seen joining the middle ply (7), which will be crossed by the ply (8). The loops are added along the length of the braid at the same time that the hanging strips are being worked into the braid. The bases of the loop may be put closer together by making the second crossing of the loop on the ply which crosses the first part as in loop (4). *b,* The hanging strips with loop ornamentation are shown being added to the braid, but the loops on the braid are left out of the figure to allow the technique to be clearly seen. The ends of the hanging strips are added from the same side to the middle plies from that side in exactly the same manner as in the ti leaf kilt. Thus the strip (4) joins the middle ply (2) as it comes in from the lower side. It will be crossed by the ply (1) and the end becomes an element in the ply which it joined. This technique is followed throughout. The hanging strips are added from 1.5 to 1.75 inches apart. In the kilt described there are 31 hanging strips. After the last one is added, the braiding is continued for a few inches and knotted with an overhand knot, the ends of the plies being left free.

The kilt is used in dancing but owing to the spaced nature of the hanging strips, it is put on over some other garment as additional ornamentation. This type of kilt is now usually colored with various foreign dyes and made largely

for tourist traffic. From the use of braided suspensory cords, the kilts are classified as *titi fili*.

Pandanus leaf kilts. Dancing kilts (*titi fala*) are made of strips of pandanus leaf and though the material may be *lau'ie* they are referred to as *titi fala*. The kilt figured in Plate XXII, *C*, is made from the discarded under layer of *lau'ie* provided by the preparation of material for fine mats. It is thus really a by product. The strips are about 0.5 inches wide.

Two suspensory cords of two-ply sennit twist are used as a waistband but the pandanus strips are attached to them in a different way to that in *fau* kilts. (See fig. 142.)

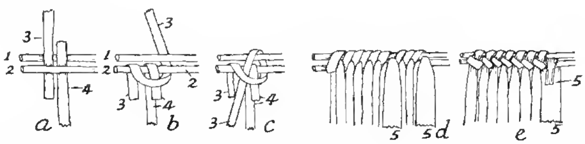


FIGURE 142.—Pandanus kilt, double cord attachment: *a*, two strips (3 and 4) are placed between the cords (1 and 2), the left strip with the short end down and the other reversed; *b*, the short upper end of the right strip (4) is doubled downwards to the near side of the lower cord (2) and the upper long end of the left strip (3) makes a loop on the near side and passing over both parts of the right strip, passes under both cords on the right of the right strip; *c*, the long end of the left strip (3) is brought over the top of both cords and passed down through its own loop. On drawing the loop taut, it brings the two cords close together and thus jams both strips between them while the loop keeps down the short end of the right strip (4). *d*, Other pairs are added in the same way and the appearance from the front shown. Every here and there, wide strips of the thin layer of the full width of the *lau'ie* leaf (5) are attached for ornamentation. The upper ends are simply pressed together to narrow them and the narrowed ends pushed down between the two suspensory cords. The tightening up of the cords by the following looped strips keeps them in position. *e*, The appearance at the back and also the short end of the wide strip (5) that has been pushed through.

The ornamental wide strips in the kilt described were dyed with *'o'a* native dye and also with some foreign trade dye. Some strips consisted of the full leaf unsplit into layers and ornamented with narrow, dyed strips from the upper layer of the *lau'ie* which were sewn across in various patterns. Though the idea of sewing patterns is foreign, the foundation technique of the kilt is native. Such kilts have no high status, but in the making used waste material made available by some more important activity, thus saving labor.

The feather kilt (*titi 'ula*) is shown in Plate XXII, *A*. The feathers are attached to fine two-ply twisted cords in small bunches. (See figure 143.)

The *titi 'ula* is worn outside of other garments for dances and festivals. As the name *'ula* implies, the feathers consisted of the red feathers of the parrakeet, usually obtained from Fiji. Some say that the kilt also is an introduction from Fiji whilst others maintain that it is old Samoan. The scarcity of red feathers which barely met the demand for the highly prized

fine mats favors the former contention. Kilts made of the green feathers of the Samoan parrakeet are more common than those made of the red, but the name *titi 'ula* is now applied to any feather kilt irrespective of color. The feather kilt is kept in a bamboo cage (Pl. XXII, *B.*) wrapped completely in a thin sheet of bark cloth and suspended from the roof with a long cord by which the cage may be lowered when required.

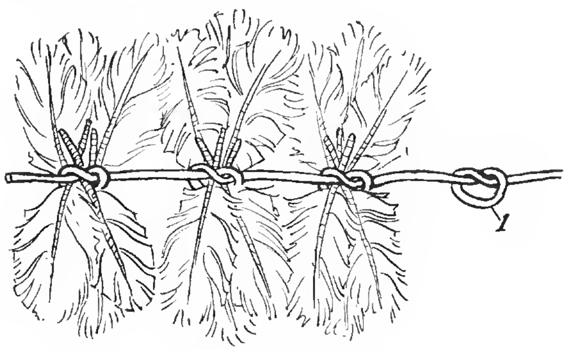


FIGURE 143.—Feather kilt (*titi 'ula*), feather attachment. The cord is formed into an open overhand knot (1), the quills of three or four feathers are passed through from either side and the knot drawn taut. This is repeated every 0.25 to 0.5 inch along the cord, as shown on the left. An average of 23 knots are made on each of 22 cords. The upper ends of the cords which are free of feathers are plaited into a three-ply braid of single layer bark cloth (*lau u'a*) a little over an inch apart. The method is the same as in the kilt of *fanga i'o*.

PLAITED KILTS

Another class of kilts, made from strips of *fau* or *fangai'o* bast, resembles the previous ones of that material in the form of attaching strips to one or two suspensory cords and are hence classified as *titi fatu*. They differ in the

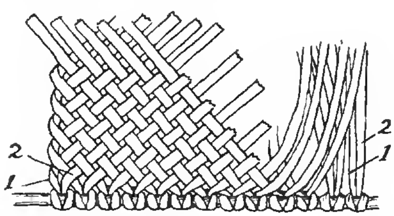


FIGURE 144.—Plaited kilt, check plait. Each pair of strips (1 and 2) formed by a single attachment is diverged, the one on the left into a sinistral and that on the right into a dextral. Plaiting commences on the left and the first sinistral (1) has naturally no course in that direction as it is turned in to define the left edge, but the second element (2) has a clear course as a dextral. To get a working edge, the left edge is built up by turning each projecting sinistral as it reaches the margin in under the sinistral above it to maintain the check. The working edge is worked across in the orthodox manner. As it proceeds, it seems immaterial which element of the pair is used as a dextral or sinistral. The right edge is formed with the usual half turns of the projecting dextrals.

hanging strips being plaited immediately below the cord attachments for a varying depth in check or twill.

The check plait type (Pl. XXIII, *A*) is commenced with the single cord attachment after which the cord is turned towards the worker and the strips plaited in check in the same technique as plaiting a mat. (See fig. 144.)

In the type kilt, the plaiting was continued for a depth of 6 inches and a width of 2 feet 3 inches. From the last plaiting edge, the weft ends were simply left free without any special technique. When worn, the kilt had a plaited waistband with the ends of the wefts hanging down as a fringe for another 1 foot 10 inches, making a total depth of 2 feet 4 inches. The free ends were further split and combed out into their individual fibres. The upper suspensory cords formed the ties.

The twilled plait type of kilt (Pl. XXIII, *B*) has come into common use for dances and trade. Though showing modern influences, the technique is native. In the type figured, two suspensory cords are used but with a different method of attaching the strips to that described in figure 139. The full technique is shown in figure 145.

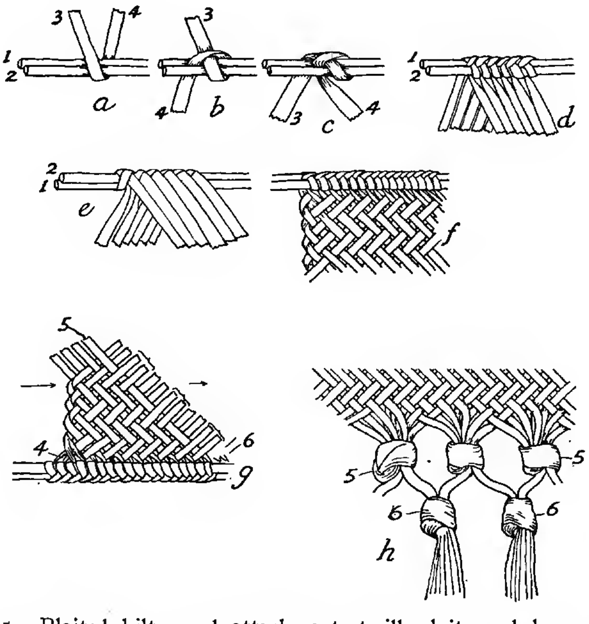


FIGURE 145.—Plaited kilt, cord attachment, twill plait, and lower fringe: *a*, the two cords (1 and 2) are held together on the same level and a strip of bast is doubled under them to form a near part (3) and a far part (4) while the near part (3) is inclined to the left; *b*, the near part (3) is passed backwards over both cords. The far part (4) is turned to the left to pass over the near part (3) and passed down between the cords; *c*, the far part (4) which was to the left is pulled towards the right under the cords and the near part (3) is doubled down behind the cords and diverged to the left; *d*, the method of attachment is continued towards the right but in actual technique with

the ends of the cords tied to a post or the toes, the work will proceed towards the worker; *e*, appearance of the attachments from the opposite side. The strips are attached for the full width of the kilt, 2 feet 7 inches. The divergence of the wefts is maintained and thus naturally form sinistral and dextral series. *f*, Appearance of the technique of the kilt as it hangs in position; *g*, the cords are turned towards the plaiter in actual work and the usual plaiting technique in twilled twos carried out. The left edge is formed while building up the working edge. The craftswoman uses her own judgment at the left edge as to whether the turned in wefts shall pass above or below the projecting weft above it and whether check strokes should be introduced here and there near the edge until the twill strokes can be established. After getting a working depth as indicated by the arrows, she carries the working section right across the full width to the right margin, when the right edge is turned. The pattern is in horizontal lines of twilled-twos. At the working edge, the pairs that have been raised above the working sinistral (5) are shown in brackets. The movement is not completed in the figure. In completing it from the top, the top weft of each raised pair is dropped, the lower held and another picked up below it. To form the lowest pair, a new dextral (6) will be picked up. The next sinistral is then laid in the shed formed and the twilled twos will form horizontal lines as a result. The plaiting is continued until a depth of 6.5 inches is reached. Each weft is composed of the strip from two attachments as may be seen in the sinistral wefts which pass in front of the dextral wefts at their attachment. It will also be noticed that the first two strips (4) on the left have been turned immediately to the right to assist in commencing the left edge. *h*, The plaiting edge of the last section is turned towards the worker. The free wefts are collected in groups of eight (4 dextrals and 4 sinistrals) and tied with an overhand knot (5). This is continued throughout. The wefts from each knot (5) are divided into two lots and the adjacent lots from each knot again tied in a second row of knots (6). Below the second row, the free ends of the strips hang down as a fringe for about 13 inches.

The exterior surface of the plaited band is decorated in various ways which show foreign influence as regards motives and the use of sewing. The type kilt has a border formed by a wide strip of *fangai'o* bast dyed navy blue and folded in a zigzag as it was stitched to a strip of pandanus leaf with a sewing machine. This native ribband was stitched at intervals to the bast band with dyed bast. Rosettes and artificial flowers of dyed bast are also stitched on with bast threads.

Much ingenuity has been displayed in forms of ornamentation. Though stimulated by trade competition, the adaptation of foreign motives to suit native material and technique are worthy of note. By the use of foreign dyes, the native craftswoman hopes to attract buyers from the people to whose culture the dyes belong. She thus commits atrocities which the foreigner, for whom they were committed, mistakenly attributes to inherent error in the native sense of the artistic. The fact that such objects command a ready sale at Pago Pago on steamer day shows that the native estimate of foreign taste is based on practical experience.

TEXTILE KILTS

The *'ie* class of kilt is distinguished by an important change in technique. The braid commencement (*fili*) and the suspensory cord attachment (*fatu*) are both discarded. Plaiting (*lalanga*) now assumes primary importance for

not only is the plaited band made deeper but the garment is commenced at the lower left hand corner in the orthodox plaiting commencement characteristic of Samoan textiles (*'ie*). The garments are thus called *'ie* to distinguish them from the suspensory class of kilt (*titi*) in which the plaited band of the last two types is secondary as regards technique. To distinguish the *'ie* kilt from the full sized *'ie* garment, the qualifying word *pupu'u* (short) is added to *'ie* while *tutu* refers to the characteristic braided tails which stand out from all the edges, hence the full name of the garment, *'ie tutu pupu'u.*

Owing to the plaiting commencement and all the weft ends being braided into tails, the garment has to be attached around the waist by a separate cord which has no structural connection with it.

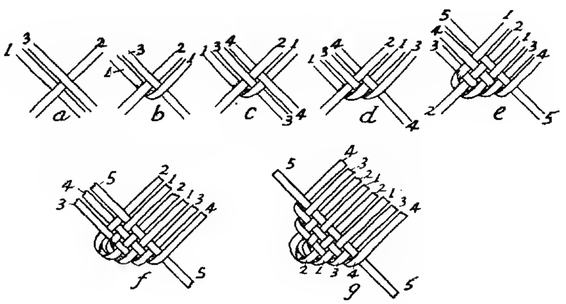


FIGURE 146.—Left corner commencement of all *'ie* garments: *a*, a sinistral weft (1) is crossed by a dextral weft (2) and a second sinistral (3) is crossed over the dextral; *b*, the lower end of the first sinistral (1) is turned over at right angles to cross above the second sinistral (3) and function as a dextral. The turn defines the commencement of the lower edge of the garment. *c*, A third sinistral (4) is added parallel with (3) and below the upper dextral (2) and above the lower dextral (1) to comply with check technique. Observe that the plaiting is moving to the right by the addition of fresh strips as sinistral wefts. *d*, The lower end of the second sinistral (3) is turned over at right angles to cross the third sinistral (4), function as a dextral, and continue the definition of the lower edge. Observe that while fresh sinistrals are formed by adding new strips of material, the fresh dextrals are formed by turning up the lower ends of the sinistrals at lower edge. *e*, The plaiting is advanced another step by adding another sinistral (5) over the dextrals (2 and 3) and under (1) to comply with check technique and then turning the lower end of the sinistral (4) over it to define the edge and act as a dextral. The formation of the left corner is commenced by turning the lowest sinistral (1) on the left at right angles to function as a dextral by running parallel above the dextral weft (2). In passing into position, the upper end of the sinistral (4) is raised above it to continue the check technique. *f*, The lower end of the corner weft (2), which was the only original dextral laid down, makes two half turns to run back into the body of the plaiting, parallel with the upper side of (1). To comply with check technique, it must pass under the sinistrals (3 and 5) and over (4). This turn defines the left corner and commences the left edge. *g*, The sinistral (3) is turned in with a half turn to continue the edge. It passes under (4) and over (5) and functions as a dextral. The next sinistral (4) continues the left edge by passing under (5). The commencing corner is now completed, being bordered by the clear edges below and on the left to form a clear triangle, of which the base is the weft (5). The triangle may be made larger by turning in the weft (5) and successive wefts at both the lower and left edges.

The *'ie tutu pupu'u* is the highest development of the kilt. They were made for young men and women of high rank to use in the ceremonial dances on important occasions.

The *'ie* kilts are made of *fau* bast. The wefts usually consist of double strips which make it possible for one weft element to be turned in to define the edge of the garment while the other is left projecting beyond the edge to

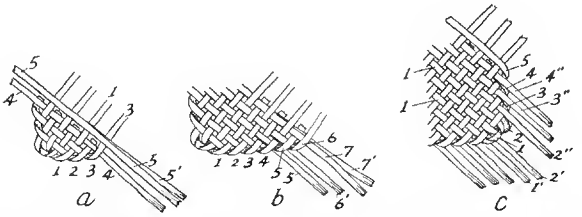


FIGURE 147.—Textile kilt, first working section with left corner, lower edge, right corner and right edge: *a*, the left corner shows the double sinistral (5, 5′) in position in the shed provided by the two series of working dextrals, of which the turned back series is shown cut off so as not to obscure the clear corner. The sinistral (4) is also shown in position before turning in the ends at both edges, while the wefts (1, 2, and 3) have already been turned. *b*, The sinistral (4) is turned in over the double sinistral (5, 5′) at the lower border to complete the lower edge of the corner. The check movement is completed over (5, 5′). The new double sinistral (6, 6′) is placed in the shed provided. With the next check movement, the upper element (5) of the last double sinistral is turned up over (6, 6′) to define the lower edge and reinforce the working dextrals while the lower element (5′) is left projecting as a fringe element. Similarly, when the new weft (7, 7′) is laid in position, the upper element (6) of the last weft is turned in to define the edge while the lower element (6′) remains as a fringe element. The plaiting proceeds to the right by adding a double sinistral after each movement. The new sinistrals are placed so as to leave a sufficient length for the fringe. With each movement, the upper element of the preceding sinistral turns upwards to define the lower edge and provide a new working dextral at the lower end of the working edge, while the lower element remains projecting from the lower edge to provide the fringe. *c*, On reaching the full width, the right corner is defined in the same manner as the left (fig. 146), but the elements naturally run in the opposite direction. Here the last weft defining the lower edge is (1, 1′). The lower element (1′) is left out for the fringe, while the upper element (1) after making two half turns, passes over the sinistral (2, 2′) to define the corner and functions again as a sinistral. The next double weft leaves the lower element (2′) out for the fringe while the upper element (2) by making two half turns completes the corner, commences the right edge and functions again as a sinistral.

As there is no necessity to keep the right corner clear, the sinistral strip (2″) is laid over (2) as it lies in the shed. The strip (2″) is placed with sufficient length projecting on the right to provide a fringe element. The next movement of the working dextrals includes the double weft (2, 2″) in the plaiting. Thus the weft (2) lost one element at the lower edge but gained another at the right edge. The next dextral (3) which reaches the right edge is turned in to act as a sinistral and continue the definition of the right edge. The fringe element (3″) is added to it and similarly the fringe element (4″) to the weft (4). The dextral weft (5) shows the half turn at the edge, where it is changed into a functioning sinistral and lies in the shed before the addition of the fringe element.

Thus the right edge is formed as in usual plaiting by turning in the dextrals as they reach the edge. The change of direction converts them into sinistrals but before they are covered, fresh strips to form the fringe are added to them.

provide fringe elements. The check stroke is used throughout. Plaiting commences at the lower left corner. Both elements of the double wefts are turned in at the lower and left edges to make a clear start before the fringe elements are allowed to project from the edges. The clear "commencing corner" is characteristic of all the *'ie* garments including kilts, shaggy cloaks and fine mats. (See fig. 146.)

The completion of the commencing corner provides an oblique working edge formed by a number of working dextrals. From the working section thus provided, a section of plaiting is carried towards the right for the full width of the garment. As the plaiting proceeds, the lower edge is continued and fringe elements provided. On reaching the full width, the right lower corner is formed as well as the right edge of the garment for the depth of the section. In forming the right edge, fringe elements are also provided. (See fig. 147.)

On completion of the first working section, another section is commenced on the left. The left edge has to be built up above the commencing corner, and in doing so, fringe elements have to be provided for. In the lower working sections, the fringe elements of the left edge are provided by the one element of the double sinistrals as they reach the edge. Higher up the left edge the fringe is formed by adding new elements. The right edge with the addition of fringe elements remains the same throughout. The body of the garment continues in check throughout, but when the garment reaches a certain depth, a row of fringe elements is run across the body from left to right. The methods of providing the fringe elements on the left and on the body are shown in figure 148.

When the garment reaches a depth of about 11 inches, the upper finishing edge is defined as the last working section advances from left to right. The finishing edge must be formed as in the other three edges by turning in one set of elements to form a turned edge, and leaving another set of elements to provide the fringe. The usual method is shown in figure 149.

An alternate finish to the upper edge, not so neat, is shown in figure 150. There the last working section was left along the upper edge in the ordinary condition of plaiting edges. What would have been an insecure finish is remedied by the braided tail technique.

With the ending of the last working section, the body of the garment is completed with all four edges clearly defined, and fringe elements projecting from all. The fringe elements are then finished off by plaiting them into three-ply braid tails.

The fringe elements are braided for a short distance, tied, and the ends left free as a fringe. (See fig. 149.) A different technique is used in the garment with the plaiting edge finish. (See fig. 150.) All the fringe elements

on all four borders are braided as shown. Where any wider intervals occur, as in figure 149, 5, strips of bast are passed through the plaiting, doubled around the edge, and plaited into three-ply braid. The sides of the commencing corners are often treated in a similar manner. The commencing corner, however, can always be distinguished from the manner in which the fringe elements have been added.

Three varieties of textile kilts are figured in the Plates, each with some variation in technique, dyeing or material.

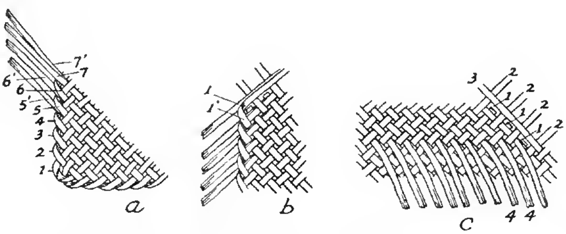


FIGURE 148.—Textile kilt, fringe additions on left edge and body: *a,* the clear left edge of the commencing corner is defined by the half turns of the wefts (1-4). When the plaiting movement is made over the weft above (4) both elements (5, 5′) project beyond the left edge. When the next sinistral (6, 6′) is laid in the shed, the upper element (5) of the preceding sinistral is turned in under it to define the edge while the lower element (5′) is left projecting as the fringe element. Similarly when the next double sinistral (7, 7′) is laid in position, the upper element (6) of the preceding sinistral is turned in under it to continue the edge while the other element (6′) continues the fringe. Thus, the left edge is continued by turning in the sinistrals as they reach the edge. As, however, the wefts are double and a fringe has to be provided, the upper elements turn in to define the edge and provide working dextrals while the lower elements provide the fringe. The left edge is built up sufficiently to give the depth of a working section, when the section is carried across to the right edge. *b,* As the plaiting deepens, the sinistrals occupy a longer course and some are not so thick on reaching the left edge. The whole weft as in (1′) is turned in to define the left edge, both elements continue on as dextrals and no element is separated from the sinistral end of their course to provide a fringe element. Fresh strips as (1) are added to their dextral course to provide the fringe. The fresh strip is laid down first and the sinistral turned into its dextral course above it. Thus the fringe elements of the deeper part of the left edge run in an opposite direction to those in the first part of the edge (*a*). All the fringe elements on the left in (*b*) are shown under the functioning dextrals. *c,* A row of fringe elements was added across the body of the garment when the plaiting had reached a depth of about 10.5 inches. As the sinistrals are laid in the shed provided at the working edge, fresh strips (4) are placed above them with their lower ends projecting downwards. Each movement includes the fresh strip in the plaiting as elements of the sinistral wefts while the lower ends project free on the completed plaiting to form a fringe. Thus the wefts numbered (2) form the series of working dextrals left down, while those numbered (1) represent the raised series. The sinistral (3) is laid in the shed formed. Another strip, such as (4), will be laid on (3) and the plaiting movement completed. By repeating the addition of a strip with each movement, the row of fringe ends runs in an even line from left to right across the full width of the garment. The above technique is simply the method of adding fresh strip to shortening sinistral wefts but instead of the lower ends being cut off short they are purposely left long.

The garment in Plate XXIV, *A,* was dyed in a mixture of black candlenut, *lama,* and brown *'o'a* and afterwards smoked to darken it further. All the edges were made with the usual half turns and the braided tails followed the technique in fig. 149.

The second variety (Pl. XXIV, *B*) is a larger and better looking garment, but three edges follow the ordinary plaiting edge technique. (See fig. 150.) The lower edge follows the orthodox technique of turning up one element of each double sinistral (fig. 147), but on the left edge, the whole sinistral projects to form the fringe while new double dextrals are added from the edge with their ends also projecting to form a double set of fringe elements. On the right edge, the dextrals as they reach the edge are not turned but the whole wefts are left projecting as fringe elements. Fresh sinistrals are added from the right edge also with their ends projecting to form a double set of fringe elements. At the upper edge, the ordinary plaiting

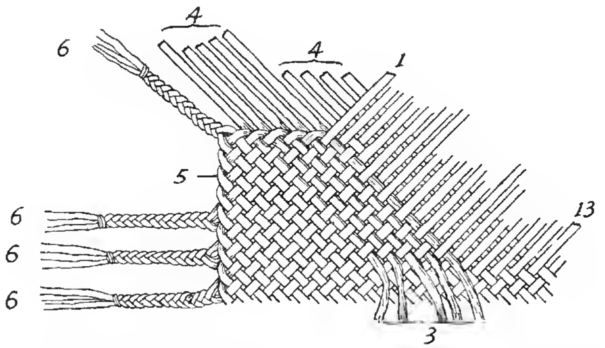


FIGURE 149.—Textile kilt, upper edge, fringe and braided tails. The oblique working edge of the last working section is shown with both series of working dextrals (1 to 13) down. The upper edge is defined by turning in the dextral wefts as they reach the edge. After each movement, the sinistral from below is laid in the shed and the top member of the working dextrals is turned down upon it to be disposed of as a sinistral element. At the lower end of the working edge, they project down on the completed plaiting as fringe elements (3). In some garments they may be cut off short, but in others they join the fringe elements described in figure 148, *c.* The sinistral wefts (4) as they reach the upper edge are left projecting to provide fringe elements. Two adjacent fringe elements are split into three strands, plaited into a braid tail for about 2.5 inches and bound by one of the plies, making a half-hitch around the other two (6). The fringe strips are about 18 inches long and the free ends after the plaiting of the braid form a fringe. A bare interval is left near the left corner (5) where no fringe elements were added so as not to confuse the corner technique.

edge is maintained. (See fig. 150.) The upper, left, and right edges had each a double set of fringe elements which make the braid tails much heavier in this garment than in the first variety. The garment was dyed with *'o'a* to a reddish-brown color.

The third variety (Pl. XXV, *B*), made of *fau pata* bast, shows a combination of the two other varieties in the formation of the edges and the provision of fringe elements. The lower edge is orthodox in following the other two. On the left, a combination is made of the two methods shown in figure 148, *a* and *b*. Thus one element of the double sinistrals is left out as a fringe but when the other element is turned in to define the edge, a dextral fringe element is added to it as in figure 148 *b*. On the right, one element of the dextrals is left out as a fringe element in addition to the elements added in the normal way. (See fig. 147 *c*.) At the upper edge, only one element of

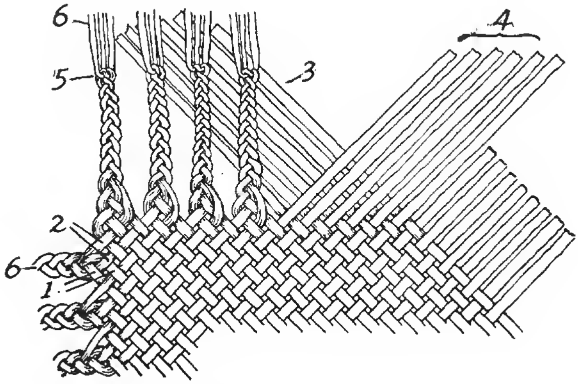


FIGURE 150.—Textile kilt, alternate plaiting edge finish, and braid tails. The ordinary plaiting edge finish is shown on the right, where the dextrals (4) and the sinistrals (3) project in their natural direction after the last check crossing. The same finish was also used on the side edges. The braid tails are formed by taking two elements of each crossing set and either combining the extra weft with one of the plies or splitting it into two and adding a part to two plies. Thus on the left, two sinistral elements (1) have been combined with two dextrals (2) to form the three-ply braid (6). The plies are braided for about three inches and fixed by tying the two outer plies into a single overhand knot (5). The remainder of the plies forms a fringe. In the technique figured in figure 148, *c*, the additional sinistral wefts that formed the fringe on the body with their lower ends also added to the upper edge fringe with their upper ends. The completion of the last section of plaiting also automatically completes the upper edge and the upper end of the right edge.

the dextrals is turned down on the working sinistrals instead of both (fig. 149) while the other is left out to form an extra set of fringe elements. The technique is superior to that in the other two varieties, in that it forms a turned edge on all four borders and provides a double set of crossing fringe elements at the right, left and upper edges. The outer surface is covered with tags arranged in transverse and oblique rows. (See fig. 151.) Besides the braided tails on all borders, the highest fringe row on the body of the garment is braided at either end. On completion, the garment is washed and bleached repeatedly until it is white. The tags are combed out to separate the fibres, which gives the garment a fleecy appearance.

The garments, on completion, form a plaited textile wide enough to pass completely round the waist and averaging about 18 inches in depth. Owing to the thicker fringe at the upper technical border with the resulting greater number of braid tails, and also the transverse body fringe near it, this border is turned downwards when the kilt is worn. The garment is tied around the waist with a separate cord and the fringed edge above turned forward over it so that all the braid tails hang down over the cord. (See Pl. XXV, *A*.)

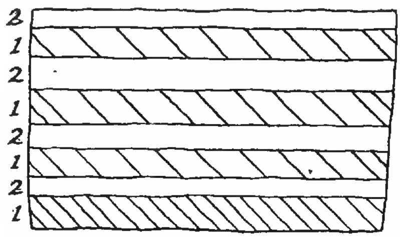


FIGURE 151.—Textile *fau pata* kilt, arrangement of tags. Tags 6 or 7 inches long of the same material as the wefts, are twisted around the dextral wefts in transverse and oblique rows as the plaiting proceeds. Seven rows are made from left to right across the full width of the garment, dividing it into eight panels. Commencing from below, each alternate panel (1) is crossed by parallel oblique rows which follow the line of the oblique working edge. These panels from below up are 3, 2, 3, and 2.5 inches in depth while the number of oblique rows in each panel is 20, 12, 13, and 10 respectively. The bare panels (2) from below up are 1.5, 2, 2.5, and 1 inches in depth respectively. The arrangement is figured as it foreshadows the closer arrangement of tags on the shaggy cloaks.

Fine mat kilt (*'ie lavalava*). A dance kilt of the same material and plaiting as the fine mats is called *'ie lavalava*. (See Pl. XXVI, *B*.) The sinistrals on the left and the dextrals on the right are turned in to define plain side edges. At the upper border, the wefts are simply left free along the plaiting edge to form a fringe of natural weft ends. At the lower border, a similar plaiting edge was formed. Here both dextrals and sinistrals are taken in small groups, divided into three, and plaited as free braids for 3 inches. The two outer plies are then knotted and the free ends form a 12-inch fringe. To the lower ends of the braided tails, red and green feathers are tied. Other ornamentation consisting of a marginal strip of bast and strips of *lau 'ie* to form side fringes have been sewn on with a sewing machine and belong to the period of over-ornamentation created by foreign contact.

SHAGGY GARMENTS

The larger garments, generally termed shaggy mats (*'ie fau* and *'ie sina*), are a further development in technique to the short textile kilts. Though about the same width as the larger *'ie* kilts, they are much deeper and may thus be termed skirts rather than kilts. All the edges have fringes of the

free ends of both dextral and sinistral wefts, but they are never plaited into three-ply braid tails. The outer surface is completely covered with strips of the same material as the wefts, but these are now separate strips attached by a special technique.

The material consists of the bast of the *fau tu* (*Hibiscus tiliaceus*) and the *fau pata* (*Cypholopus macrocephalus*). The *fau tangaloa* (*Hibiscus tetraphyllus*) is also used. The wefts are narrower but even in one garment there is considerable range in width. The plaiting stroke used is the check and all garments commence at the lower left hand corner with the typical corner commencement free of fringes seen in the *'ie* kilts. (See fig. 146.)

The garments are divided mainly into *'ie fau* and *'ie sina* according to material, and varieties are also named from treatment to obtain change of color.

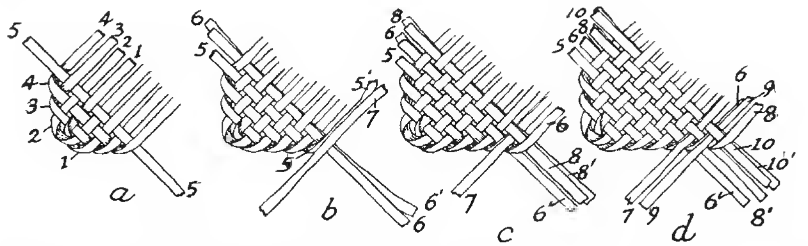


FIGURE 152.—Shaggy garment (*'ie fau*), left corner commencement and lower edge: *a*, the corner has been formed by turning the wefts (1-4) as in fig. 146 and a working edge provided as shown by the sinistral (5) which lies in the shed; *b*, a new double sinistral consisting of the strips (6 and 6′) is added and the sinistral (5) turned up over it to act as a dextral and define the lower edge. Upon the new dextral (5) a fresh dextral (7) is laid with its lower end projecting below the lower edge to provide the dextral fringe element. *c*, Another double sinistral (8 and 8′) is placed in position and the upper element (6) of the preceding double weft is turned up over it to act as a dextral while the other strip (6′) provides the sinistral fringe element; *d*, from the last figure, a new dextral strip (9) is laid on the turned up dextral (6). A new double sinistral (10 and 10′) is then added and the upper element (8) of the preceding sinistral is turned up over it to act as a dextral while the lower strip (8′) provides the sinistral fringe element. A good working depth is secured which is continued along the full width of the lower border by adding double sinistral wefts, turning up one element as a dextral and adding a dextral fringe element in the manner figured. Thus each weft in the actual plaiting is double and the double layer of crossing fringe elements is added.

The brown shaggy garment (*'ie fau*) is made of strips of *fau tu* with fairly coarse wefts. Though in parts, not much finer than the *'ie* kilts of the same materials, more care is exercised in the plaiting. The garment figured in Plate XXVII, *A*, is a good specimen. The shaggy outer appearance is produced by the close attachment of tags, but the turned-down corner shows the check plaiting technique. The garment is roughly rectangular, but the edges are never of even width owing to the difficulty of controlling exactly the width and thickness of the wefts, which also stretch. The wefts are double but alter

in thickness with the addition to and taking away of weft elements. The undyed material assumes a rich brown color.

Plaiting commences with the clear lower left corner made in exactly the same way as in *'ie* kilts. The plaiting of the first working section follows the same technique except that on the lower edge, in addition to the fringe elements provided by the double sinistral wefts, a second series of crossing fringe elements is added to the dextral wefts. (See fig. 152.)

The full width of the garment having been made, the right corner is turned and the right edge continued upward to complete the first working section. In both processes, the technique is the same as in *'ie* kilts, except that a second set of fringe elements is provided on the right. (See fig. 153.)

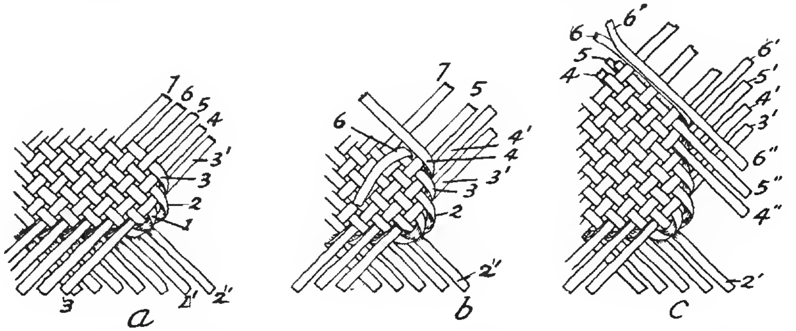


FIGURE 153.—Shaggy garment: *a*, right lower corner; *b*, right edge; *c*, right fringe. *a*, The last sinistral of the lower border, has the upper element (1) turned over the sinistral (2 and 2′) at a right angle and then at another right angle to act as a sinistral, while its lower element (1′) is left as a fringe element. The next sinistral has its upper element (2) also turned through two right angles to function as a sinistral while its lower element (2′) remains in the lower fringe. The turning of these two wefts forms the corner while the turn of (2) forms the commencement of the right edge. *b*, Above the turn of (2) the double dextral weft (3 and 3′) has reached the right edge. The upper element (3) is turned in to act as a sinistral weft while the lower (3′) is left projecting beyond the edge to act as a dextral fringe element. The right edge is continued upwards to complete the working section by turning in the upper element of the next dextral weft (4) to act as a sinistral while the lower element (4′) projects as a dextral fringe element of the double dextral wefts as they successively reach the right edge. The upper elements, however, which are turned in to form new sinistrals are single so fresh sinistral strips have to be added to them to make them double and provide the sinistral fringe element.

c, From the last figure, the single sinistral strip (4″) has been placed over the new sinistral (4) and included in the plaiting while its outer end provides the needed sinistral fringe element. Similarly the sinistral strips (5″ and 6″) have been added to the sinistrals (5 and 6) as they were turned in at the right edge while their lower elements (5′ and 6′) continued on past the edge to form dextral fringe elements. The above technique is continued upwards as each working section reaches the right edge.

In commencing the next working section, the left edge has to be carried upwards from that part already formed by the left commencing corner. The technique is again identical with that in textile kilts except that a fresh set of

fringe elements is added to form two sets, as in the previous two edges. (See fig. 154.) Owing to the length of the soft fibrous wefts, the dextral and sinistral wefts are tied together in separate groups (*fausa*) to prevent their becoming entangled. The *fausa* are formed by twisting a group together loosely, folding them backwards and forwards from the top ends and catching the folds in a half hitch from the slack on the end towards the plaiting edge. All wefts are thus treated. The two *fausa* on the right of the working edge are released and folded again on the higher level on the left when the working edge reaches the next two *fausa* on the right. (See Pl. XXVIII, *A*.) The working edge is fairly long, but a short one is shown in figure 155 to emphasize the identity of the plaiting technique with the ordinary technique used with coconut leaflets and coarser pandanus wefts.

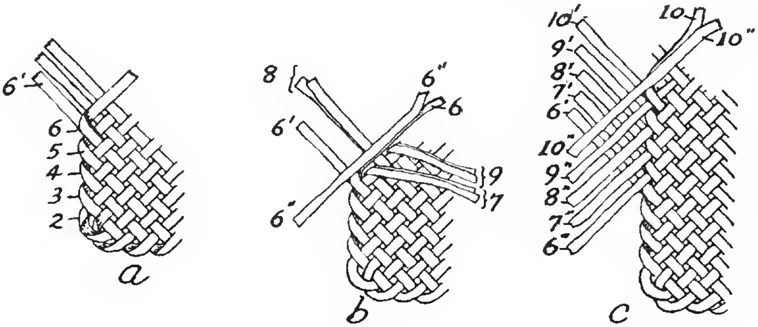


FIGURE 154.—Shaggy garment, left edge, and second set of fringe elements: *a*, the left edge of the commencing corner is shown by the turns of the wefts (2-5). The provision of fringe elements commences with the double sinistral (6, 6′), in which the upper element (6) is turned in to define the edge and act as a dextral while the lower element (6′) is left protruding as the usual fringe element of the first set. *b*, The second set of fringe elements is provided by adding fresh strips successively to the dextral wefts as they are turned at the left edge. Thus, with turned in dextral (6) in position, the fresh strip (6″) is laid on the dextral with its end projecting to provide the fringe. *c*, The method of turning the upper elements of the double sinistrals and adding fresh elements to the turned in dextrals is continued for the depth of the working section and with each successive working section for the full depth of the garment. Thus the wefts (6′ to 10′) belong to the first series formed by the lower elements of the double sinistrals, while the wefts (6″ to 10″) provide newly added fringe elements. The technique in shaggy garments is a combination of the two methods of providing fringe elements in textile kilts (fig. 148 *a* and *b*), except that in adding the dextral set, the fringe element is placed above the dextral weft instead of below as in figure 148 *b*.

The feature of the shaggy garments is the close covering of tags over the whole of the outer surface. The tags consist of fibrous strips of the same material as the wefts and they are placed in position at the working edge during the process of plaiting. The attachment of tags thus commences with the first working section and is continued throughout with each successive working section. Three methods of adding tags are in use:

(1) The first method consists of leaving out a length of new sinistrals as they are placed in the shed at the working edge. The method has been described with textile kilts in figure 148, *c*. Though used as a fringe in textile kilts the method is also used to augment the tags in shaggy cloaks. (See fig. 155.) The upper ends of shortening sinistrals may be left out also on the upper surface of the garment and the same applies to both ends of dextral wefts. Thus, where in ordinary plaiting the ends of wefts are cut off close to the edge of the last crossing weft, in shaggy garments they are purposely left long to assist in ornamentation.

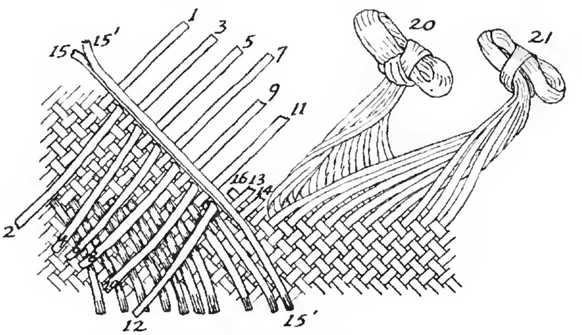


FIGURE 155.—Shaggy garment, working edge, and *fausa*. A shortened working edge with 12 dextrals is shown, with the odd numbers down and the even numbers raised to provide the shed for the working sinistral (15). In the next movement, the top dextral (1) is dropped and the new dextral (13) picked up from below to maintain the same number of working dextrals. The movement will cover the sinistral (15) while the next sinistral (16) will be placed in the new shed provided. In the next movement, weft (2) which will be top dextral, will be dropped and the dextral (14) picked up from below. Thus, the technique of actual check plaiting is the same as that used in plaiting mats. The method of adding new strips to a shortening sinistral weft is shown where the strip (15′) is laid over the shortening sinistral (15) after it has been placed in the shed. The lower end of (15′) is purposely left long and will project as a fringe element from below the dextral (12) when the plaiting movement is completed. Dextral wefts are also lengthened by laying a fresh strip over the shortening working dextral and keeping them together for a few movements. The sinistrals on the right of the working edge have been grouped in the *fausa* (20) and the dextrals separately in (21). Both *fausa* will be untied when the working edge reaches them.

(2) The loop method of attaching distinct strips seen in kava strainers and the single cord attachment of kilts (fig. 138) is also used in shaggy garments, in which the looped tags are attached to sinistral wefts at the working edge. A horizontal line of tags so attached is shown in Plate XXVII, *B*, and the detail in figure 156.

(3) The third and most-used method is attaching the tag by two turns around dextral wefts at the working edge as in figure 157.

When the plaiting with double fringed edges and tag covered upper surface has reached within one section of the end, special technique has to be called

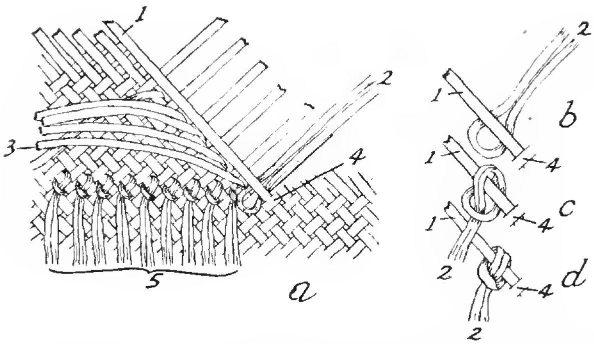


FIGURE 156.—Shaggy garment, tag attachment, single loop: *a*, the working sinistral (1) has been laid in the shed at the working edge, the dextral (3) is the lowest of the raised series of working wefts, the tag strip (2) is doubled in the middle, and the loop so formed is passed under the working sinistral (1) just above the plaited portion defined by the dextral (4). The tags (5) on the left have been fixed in position during the previous movements of the plaiting edge. *b*, The loop of the tag (2) is opened out and the forefinger passed up through it; *c*, the forefinger passes over the sinistral (1), hooks around both limbs of the tag, and draws them both through the loop; *d*, the loop is drawn taut, pressed close against the crossing dextral (4) and in the next movement the lowest raised dextral (3, *a*) will pass above the loop which is included in the plaiting as shown on the left of (*a*). The tag loop (2) really rests on the recumbent dextral between (3) and (4) and therefore does not show on the under surface of the garment. With each plaiting movement, a tag is added as above and horizontal rows are formed.

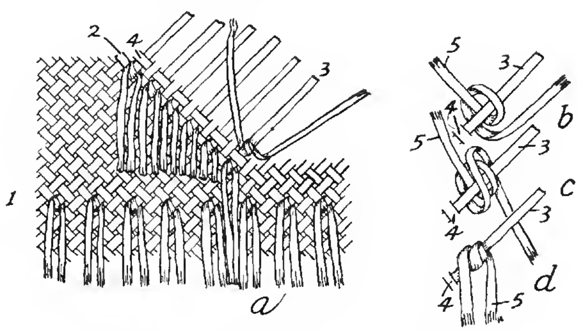


FIGURE 157.—Shaggy garments, tag attachments, two-turn twist: *a*, a horizontal row of tags (1) is shown attached to alternate dextrals and also an oblique row (2) attached in the same way. The sinistral (4) has been fixed by the plaiting movement and another oblique row of tags commenced on the working dextral (3), which will be the lowest of the raised series in the next plaiting movement. *b*, A tag strip (5) is passed under the working dextral (3), pulled along to its middle and a complete turn taken around the weft; *c*, a second complete turn is made around the weft (3) by the tag (5); *d*, the two turns are drawn taut. The turns are simple windings without any half hitch or knot. The turns are pushed down close against the last crossing sinistral (4). The tags are attached to the wefts of the raised series at the working edge. The next sinistral is laid in the shed and with the completion of the plaiting movement, the turns around the wefts will rest on the sinistral below. The next plaiting movement completely fixes the row of tags in their position on the garment.

in to deal with the left upper corner, the upper finishing edge and the right upper finishing corner. (See fig. 158.)

The knotted braid tail, which marks the ending of all the technical processes used can always be found at one of the corners of the garment placed in the proper position for study. (See Pl. XXIX, *A*.) The fringe elements at all four edges are left as tag fringes without braiding.

The white shaggy garment (*'ie sina*), made of *fau pata·* bast, is a finer garment than the *'ie fau* type made of *fau tu*. The material is scraped with a shell, dried, and split into wefts narrower than the *fau tu*. The technique is exactly the same from commencing corner to braided tail finish as in the previous garments. The tags are put on more thickly with the two-turn method. The working edge in an unfinished garment is shown in Plate

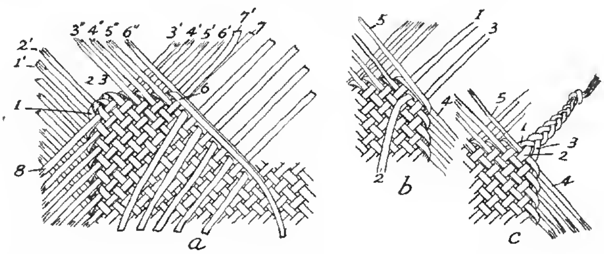


Figure 158.—Shaggy garment, left upper corner, upper edge, and right upper corner finish: *a*, the left edge of the last working section is raised in the orthodox way and the strip (8) is the last dextral fringe element added. The upper element (1) of the next sinistral weft makes two half turns over the next sinistral (2) and passes back into the plaiting on the working sinistral which it covers. The lower element (1′) is left out as a fringe element. The upper element of the next weft (2) is treated in a similar way and its lower element (2′) remains as a fringe element. The left upper corner is thus turned by the usual technique. The upper edge, commenced by the turn of the weft (2) is continued by turning down the upper element of the dextral wefts as they reach the edge, while the lower elements are left projecting to provide the dextral series of fringe elements (3′ to 7′). The working sinistrals continue beyond the edge to supply the sinistral series of fringe elements (3″ to 6″). Variation occurs as to which elements are placed first in the shed at the working edge. Thus the upper elements of the three dextrals next to (2)—(3, 4, and 5, concealed by the plaiting)—were placed in the shed first and covered by the working sinistrals (3″, 4″, and 5″). In the next movement, however, the working sinistral (6″) is placed in the shed first and the upper element (6) of the next dextral turned down upon it while the lower element (6′) is shown projecting in the fringe series. By either method, the working edge is continued towards the right. The two series of fringe elements are provided as described and there is no need to add fresh fringe elements. The ends of the turned down dextrals are left as tags where they project below the lower end of the working edge; *b*, as the working section nears the right, the working edge narrows owing to the upper and right edges converging on each other. The lower ends of the turned-down dextrals pass through to join the fringe of the right edge. The crossing of the turned-down full dextral (4) and the working sinistral (5) in the last shed, leaves a working edge formed by three dextrals of which the weft (2) is raised and (1) and (3) are recumbent. *c*, the raised weft (2) is brought over the shed in a last movement and the three wefts are plaited in a three-ply braid tail and knotted. The braid effectively fixes the plaiting and prevents unravelling.

XXVIII, *A*. In some long, narrow garments, instead of finishing the long lower edge, a short working length is made, the complete left edge is formed with its upper corner and the garment turned with what will ultimately function as the left edge towards the worker. The plaiter then works across the narrower depth of the garment to prevent the use of a greater number of *fausa,* which leads to confusion. The technique and finish is the same as described, but, owing to the position while plaiting, the braided tail finish will be formed on the right lower corner instead of the right upper.

The completed garment is bleached by soaking in sea water and drying in the sun. Repeated washings in fresh water with the leaf of the *fisoa* (*Columbrina asiatica*) as soap results in a very white color. The white textile kilt (Pl. XXV, *B*) was treated in the same way. The fringes and tags are combed out with dry coconut leaflet midribs. The completed garment is bleached and not the unplaited material as Brigham (3, p. 94) inferred when he wrote that some garments were made "Usually of fine thread by pounding the bast and bleaching the fibre until it is white as well-cleaned fibre."

The garments in Bishop Museum range from 4 feet 6 inches, to 5 feet 10 inches in width and from 2 feet 9 inches to 3 feet 6 inches in depth. The plait ranges from 9 to 16 wefts to the inch. In the garment example figured in Plate XXVIII, *B,* the thick outer coating of tags has not been combed out well and it lacks the whiteness resulting from repeated washings. The garments are heavy and clumsy in appearance but are well made, considering the material.

Attention has been drawn to the tags being attached during the plaiting of the garment as they are more easily wound round wefts which have one end free. The subsequent plaiting fixes them in position. Brigham (3, p. 94) was in error when he stated that "Pile was put on after the mat was woven by passing a parcel of the fibres with a full turn about a mesh of the mat at suitable intervals . . . ." In describing an *'ie sina* in the Otago University Museum for comparison with New Zealand technique (38, pp. 40, 41), I figured the attachment of the tags as one complete turn around a crossing weft. While this was correct for the tags examined, the two-turn twist is by far the more common form of attachment.

The *'ie fau* retains its natural color, which deepens to a yellowish brown (*'ena'ena*). As no artificial methods were used to change its color, the garment retains the name of the material in *'ie fau.* The *'ie sina* is made of *fau pata* but as the garment is bleached white by a special process its gets the name of *'ie sina* from its white color (*sina,* white). Two other varieties of shaggy cloak are distinguished by a red and black color respectively but the names given to them are derived from the coloring process.

The red shaggy garment gets the name of *'ie ta'ele* (*ta,* to treat; *'ele,* red earth) from being stained with a mixture of red earth in a wooden bowl.

The material appears to be *fau tu*. The technique is identical with the preceding shaggy cloaks and the dark red color gives it a fine appearance. (See Pl. XXIX, *A*.)

The black shaggy garment (*'ie fuipani*) according to Kramer (18, vol. 2, p. 295) was stained black (*uliuli*) by being pressed down in the mud of a swamp. It is hung up to dry but away from the sun. Before a dance, the garments are sprinkled with coconut cream to make them shine. Samoans distinguish between drying an article in the sun (*fa'ala*) and drying in the air or a breeze away from the sun (*fa'asavili*). Direct heat from the sun would bake the mud on the stained cloak and cause it to flake off instead of soaking into the material. The term *savili* denotes a breeze as against a wind (*matangi*). No example was seen but the technique was probably identical with that of the three preceding varieties.

The shaggy garments are worn around the waist as skirts and kept in place with a cord or bark cloth belt. They are heavy and uncomfortable to wear for any length of time in a tropical climate, but are used only during ceremonial to denote rank and status. The *'ie sina* was essentially the garment of the village maid and women of high rank. It was also used in the proof of virginity custom. In social value, the *'ie sina* is almost, but not quite, in the same class as fine mats. Owing to their being less in number than fine mats, they are sometimes preferred during ceremonial to demonstrate that the family possesses them.

TRANSITIONAL GARMENTS

Garments occur which contain elements from different types. They may be important as indicating the natural progression in technique that took place as craftswomen sought to evolve better types of garment as a means of expressing social distinctions.

A kilt (L. 1571) in the Bishop Museum collection, with the two-cord commencement and plaited with a twilled two-stroke for a width of 3 feet 6 inches and a depth of 10 inches, is made to resemble garment kilts by the addition of braided tails and by soaking in *'o'a dye*. (See figure 159.)

Another kilt (Pl. XXIX, *B*) shows the bottom left-hand corner commencement and body fringes characteristic of garment kilts but the body wefts at each upper corner are plaited into braids for tying around the waist.

A third kilt (Bishop Museum collection, B, 599), made of *lau'ie* pandanus strips, follows the textile kilt technique of providing tags on the outer surface and the fine mat technique in the left lower corner, lower and side edges. The treatment of the upper edge is unique in that from a plain plaiting edge, the dextral wefts are plaited at the back into a three-ply braid running from left to right and continued beyond the right edge to form a free braid tail to be used as a tying cord. The sinistral wefts are braided from right to left

and the projecting tail provides the left waist cord. Feathers are plaited into the sinistral braid by adding the quills to the braid plies.

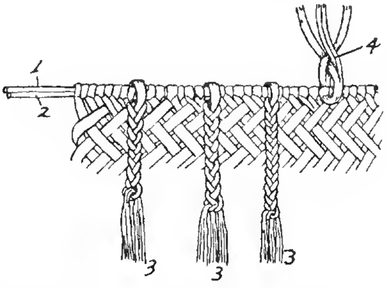


FIGURE 159.—Kilt, transitional type: The wefts are 3 to one inch. The material is *fau* bast, which is attached to two suspensory cords (1, and 2) in the manner described with the twilled kilts. The suspensory cords are carried on at the ends into three-ply braids for tying around the waist. It is thus a true kilt from the attachment of the strips and the fact that the plaiting commenced from the suspensory cords. The ends of the strips are, however, continued down from the plaited lower edge in three-ply braided tails as in the textile kilts. This is in itself of little significance, but braided tails have been added to the upper border of the kilt (3). Owing to the true kilt commencement, there are no free weft ends to supply the material. The tails are thus formed by passing fresh strips of bast around the supporting cords of the upper edge and plaiting it into braids (4). The braids are plaited for 1.5 inches and then end in a free tuft 6 inches long. Sixty-two such tails were added to the upper border and hang down over the front as a fringe.

FINE MATS

MATERIALS AND IMPLEMENTS

The term "fine mats" (*'ie tonga*) applied to articles plaited with thin narrow wefts in check and usually ornamented with fringes and red feathers, has been in use so long that it cannot be abandoned. The mats, however, are worn as skirts and thus come under the category of clothing.

The fine mats are made of *lau'ie,* the leaves of the cultivated *'ie,* a pandanus distinct from *fala* and *paongo.* In Savaii, the *lau'ie* is said to have been first brought to Falealupo by Nafanua, who subsequently became an important war goddess.

The serrated edges of the leaves are removed and the spines on the back of the midrib trimmed off. The upper shiny surface of the leaf is the *alo* and the duller under surface the *tua.* Each leaf is cut transversely across on the under surface about two inches from the butt end. The cut passes through the under layer of the leaf and this *tua,* under layer, is peeled off between the cut and the butt end, leaving the thin upper, *alo,* surface intact. After a short exposure to the sun the leaf is folded in two-foot lengths and a convenient bundle made by folding other leaves longitudinally around it. The bundle is tied around the middle with a strip of *fau* bast.

The bundles, protected by a layer of green leaves from direct contact with the hot stones, are cooked in an oven for about half an hour. The leaves from the cooked bundles are folded around the hand, reverse to the previous folding, to straighten them out. The thin, shiny *alo* layer is peeled off (*fofo'e*) by grasping with one hand the butt part, already peeled (Pl. XXX, *A*, 2), and separating it sufficiently to allow the other hand to grasp the lower layer. Owing to the cooking, the two layers readily separate by pulling, but care must be exercised as the upper layer is liable to tear at parts along the midrib that form the sites of spines. The parts that stick are separated now with a metal knife, but formerly with the edge of a bamboo strip. The coarser under layers are discarded while the thinner *alo* layers, which form the plaiting material, are strung together on a three-ply braid. (See fig. 160.)

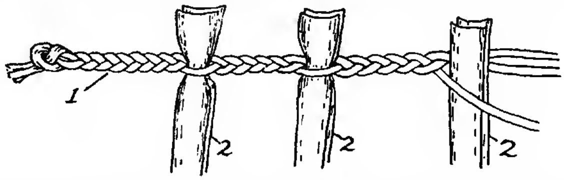


FIGURE 160.—Braiding *lau'ie* leaves (*filinga lau'ie*). Three strips of the discarded *tua* are knotted together. The knot is held between the toes and a three-ply braid plaited (1). The *alo* strips (2) are added to the braid by placing a pair of butt ends against two plies and bringing the third around them to continue the plait. So with spaced turns of the plaiting on one side, a pair of *alo* strips are added and when a convenient length is reached, the braid is knotted.

The braid with the leaves is termed *filinga lau'ie* from *fili* (to braid) and *lau'ie* (the *'ie* leaves). During the plaiting, it was interesting to observe how the foot with its grasp of the braid end between the first and second toes stretched the braid taut to facilitate the plaiting. When the braid became long, the foot was shifted up on the braid to get a shorter grip. Civilized man deprived himself of extra hands when he confined his toes in boots, whereas the barefooted Samoan uses his toes to assist his fingers in many of his crafts.

Soaking in sea water. The braid is tied to a stake in the sea or weighted down at the ends with rocks. After soaking for a fortnight to bleach them to a lighter color (*pa'epa'e*), the leaves are cut off near the braid and dried in the sun. The braid with the butt ends is discarded. (See Pl. XXX, *A*, 1.)

Rolls. The leaves are split longitudinally down the midrib and the halves wound around the fingers with the inner split surface outwards. Conveniently sized rolls, much smaller than *fala*, are compressed to an ellipse and tied with strips of the same material. In this form, they are stored for use. (See Pl. XXX, *A*, 3.)

Preparing the wefts. The implements required are a scraping board and a shell scraper.

The ordinary scraping board (*papa valu lau'ie*) is a slab of wood about 2 feet long, 0.5 inches thick, 4 inches wide at one end and 3 inches at the other. The working side is worn down perfectly smooth.

The shells used are *'u'u* (*Mytilus sp.*). The unsplit leaf is scraped with large shells, whole, or broken to provide an edge, while individual wefts are scraped with very small shells.

The half leaves are unwound from the roll and straightened out by reverse rolling around the fingers. They are laid on the board with the shiny outer surface downwards while the other surface is scraped to remove extra material. Any creases in the leaf are also removed by the scraping. The leaves are split into weft widths with a sharp point, such as the outer spines of the porcupine fish. The splitting always commences a short distance from the butt end and is run out to the tip. The unsplit butt end thus keeps a number of wefts together as in splitting *fala* leaf. The width of the wefts varies with the skill or desire of the plaiter. In a number of fine mats examined the wefts ranged from 12 to 14 to the inch, but some are finer. The pick of the material is used for the best mats while that not quite good enough (*auaunga*) is used for second-class mats.

Plaiting. The wefts are always double. The true outer surface of the material is smooth and shiny but the other scraped surface is duller and shows the longitudinal striations of the fibres. The double wefts are placed with the dull surfaces together so that the bright even surfaces will be exposed on both sides of the completed mat. Some individual wefts are formed by folding longitudinally instead of splitting. When plaiting is established, the long narrow wefts are folded into *fausa* groups as in shaggy mats. The small *'u'u* shell scrapers are used to straighten out the working wefts and a porcupine fish spine for picking up the raised sets at the working edge.

The left commencing corner (Pl. XXX, *B*) is usually formed by the same technique as in shaggy garments but an alternate method of turning the corner with one weft is also used. The side edges are turned without providing fringes and no ornamental tags are used on the body. Both the lower and upper edges have two sets of crossing fringes but, besides defining the edges by the half-turns of appropriate wefts, an additional technique is introduced of using a fixation braid at both edges. (See fig. 161.)

The fixation technique, giving a better finish to the lower edge, is really a three-ply braid. A wider technique forming a five-ply braid and a method of forming a turned-back fringe are shown in figure 162.

The three methods of lower edge finish by thickening the lower edge also strengthen it. The right corner is turned by either of the methods used with the left corner. The right edge is defined and continued upwards for the depth of the working sections in the usual way of turning in the dextrals as they reach the edge. The body is completed by a series of working sections.

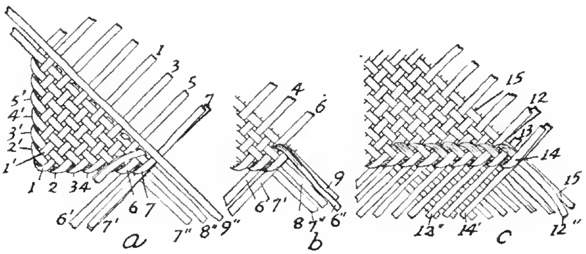


FIGURE 161.—Fine mat; alternative left corner technique, lower edge, and three-weft braid: *a,* the lower edge is formed as far as the turn of the weft (5) by turning up both elements of the double sinistral wefts to function as dextrals. To form the left corner, the first dextral laid down (1) is doubled around the sinistral (2′) to run parallel with, and immediately above, the first part of its own course to act as the dextral (1′). The corner has thus been formed by the turn of one weft instead of by two wefts as in the usual method. (See fig. 152.) The left edge is continued upwards by turning the next sinistral (2′) in under the sinistral above (3′) to act as a dextral. The succeeding sinistrals (3′ to 5′) are treated similarly in turn and the technique carried upwards to reach the depth of a working section. Throughout the left edge both elements of the sinistral wefts are turned in as there are no fringe elements to provide for. The lower edge is without fringe as far as the turn of the weft (5). From now on provision is made for adding both dextral and sinistral fringe elements. The sinistral fringe element is provided as in the *'ie fau* garment by turning up one element of the added double sinistral weft to function as a dextral and leaving the other down as a fringe element. Fresh dextral fringe elements are added to the turned up dextrals and in order to form a three-ply braid plait along the lower edge, each dextral weft must contain three elements. Both elements of the weft (6) like those which preceded it, have been turned up so a single fringe element (6′) is added to make three elements in the weft as required. This first three-element dextral weft passes over the double sinistral (7), under the next sinistral (8), and is turned back to assist in forming the next shed. The upper element (7) of the next sinistral is turned up to act as a dextral while its lower element (7″) is left down to form the sinistral fringe. The newly-added dextral fringe element (7′) must therefore contain two strips to bring the dextral weft up to the required quota of three elements. The double dextral (7′) is placed in position, the element (7) turned up on it and, the wefts of the working edge having been arranged, the next sinistral (9) is placed in the shed formed. *b,* The next plaiting movement brings the three-element dextral (6) down over the sinistral (9) when the two lower elements go on as a normal double dextral (6) but the third uppermost element (6″) is turned down on the working sinistral (9) as it lies in the working shed. In the next movement, a fresh double dextral will be placed in position between the elements of (8) and over the sinistral (9) with the turned element (6″). The upper element of (8) will be turned up as a dextral to lie on the added dextral fringe elements and a new sinistral will cross above them when placed in the next working shed. *c,* By following the technique inaugurated by the third dextral element (6″), each successive third element when it reaches a working sinistral is turned downwards. When it reaches the lower edge, it may be turned up again to continue in the braid which is formed. Thus the double dextral (12″) joined the turned up dextral (12) and after passing over and under the two crossing sinistrals was turned down on the sinistral (15) when it passed over and under the two crossing dextrals (13 and 14) to reach the edge. There it may be turned up again or left out in the fringe. The third elements of the dextrals by their downward turn define the upper edge of the fixation braid as shown in the figure. The technique is continued throughout the plaiting of the lower edge.

In a mat observed during plaiting, the working edge consisted of 64 dextrals divided into two sets. New wefts are formed individually by overlaying and dropping the end of the shortened weft on the under surface after the new weft has been fixed by a number of plaiting movements. The lower ends of the new wefts are on the upper surface of the mat. The loose ends are cut off close under the edge of a crossing weft for concealment, and trimming may take place at any stage or after completion of the mat.

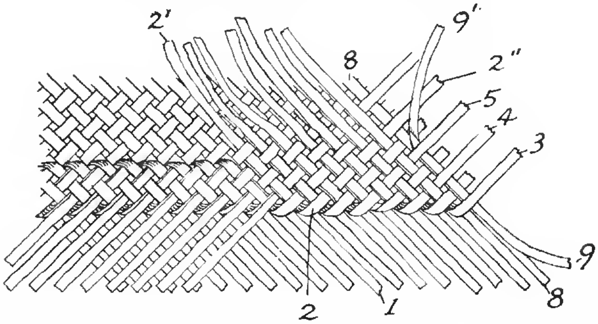


FIGURE 162.—Fine mat, lower border, five-weft braid finish (left) and turned back fringe finish (right): in the five-weft braid, the method of forming three-element dextrals (fig. 161) is followed. The third element, however, crosses over two and under two crossing sinistrals before it is turned down on a working sinistral upon which it in turn crosses over two and under two crossing dextrals before it again reaches the lower edge. From the lower edge it is again turned upwards as in the three-weft braid finish. The other method occurred in the same mat as the five-weft braid and followed on the right as shown in the figure. When the sinistral (1) was placed in the shed, another double weft (2) was placed above it with its short end (2′) turned inwards. The lower end (2″) was turned at the edge and took its place in the plaiting edge as the orthodox dextral. Before the plaiting movement closed down over the sinistral part (2′), the end above the third raised working dextral was lifted to prevent it from being included in the plaiting and so left free as a fringe element. The working edge on the right shows the working sinistral (8) in the shed with the fresh double strip (9) placed above it. The raised working dextrals have closed down over the shed, but the upper end (9′) of the fresh strip has been raised above the third raised dextral (5) and so remains as a fringe with those to the left. No fringe elements are added to the dextrals but the fringe ends on the garment fall down to mingle with those from the lower edge. The sinistrals near the edge contain four elements and the dextrals two.

The left edge of the last working section is built up, the left upper corner formed in the same way as the other corners and the upper finishing edge dealt with as in figure 163.

The upper edge is carried along with the three-weft braid finish and the right corner finished off with the three-ply braid tail as in the shaggy cloak garments (fig. 164). (See Pl. XXX, *C*.)

The knotting of the braid tail marks the completion of the plaiting technique, which may have taken months and even years of careful work, sometimes involving strained eyesight and damaged vision. It is little wonder

that sometimes the upper border is left as an ordinary plaiting edge and finished off by running it under a sewing machine. At the same time it is sad to realize that a continuous line of white cotton stitches has taken the place of the carefully turned edge, the neat three-weft braid, and the triumphantly knotted tail perfected by the deft fingers of generations of craftswomen.

Owing to unavoidable slight variations in weft widths, the side edges are never quite straight and the completed garment never exactly rectangular.

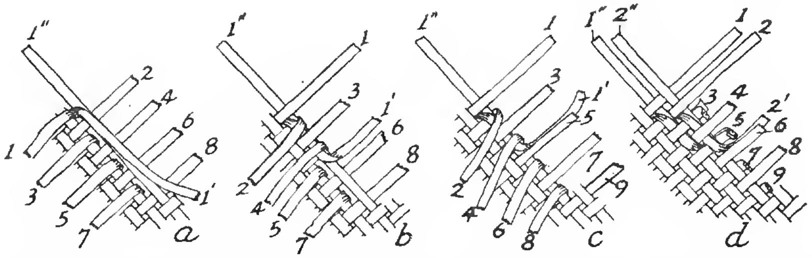


FIGURE 163.—Fine mat, upper edge. This is a variation of the method shown in figure 158 with the *'ie fau*, where after the new sinistral from below is laid in the shed formed at the working edge, an element of the top dextral is turned down over it to define the edge. In the *'ie fau*, the turned down dextral runs down the whole length of the working edge and projects below as a body tag. In the fine mat, the turned-down dextral supplies the third element to form a braid reinforcement as in the case of the lower border: *a*, The working edge of 8 dextrals at the left upper corner have been separated into two sets of alternates and the working sinistral (1″) placed in the shed. Of the top double dextral, the upper element (1) has been turned back to comply with the check technique, while the under element (1′) is turned down at right angles upon the sinistral (1″) to form the turn that defines the edge, and also to supply the third element. *b*, The next complete movement consists of reversing the two sets of alternates over the new sinistral (1″) and provides a shed for the next sinistral. Only part of the movement is shown in (*b*). Thus the top dextral (1) has been brought over the sinistral, the weft (2) picked up and brought back, (3) brought over and (4) back. Here the usual movement stops, for the turned-down element (1′) to function as a third element in the braid must return to the edge. It is therefore turned at right angles to its course as shown. *c*, The weft movement from (4) is now continued by bringing (5) forward so that it carries the third element (1′) under it and reversing (6, 7 and 8) respectively. The shed is ready for the next sinistral. With each movement, however, the dextral which was top in the last movement drops out of action in the working set while a new one from below completes the complement. Thus the weft (1) is finished with and acts as a fringe element. The top weft in the working set is now (2) which has been turned back. *d*, Here the next sinistral (2″) has been placed in position and the weft movement made over it. Thus, the under element of the top weft (2) was turned down on the sinistral before the reversing of the dextrals took place. After the wefts (2 and 4) had been turned forward and (3 and 5) brought back, the turned-down third element (2′) is turned forward at right angles and the weft (6) turned forward with it. The new weft (9) now comes into the working combination in place of the discarded (1). Thus, the under elements of the top wefts are turned down on the new sinistral and are turned at right angles on the under surface of the third dextral weft from the top which crosses over the sinistral With this weft it reaches the upper edge. With the weft element (5) which carries the turned back third element (1′) every top weft will have three elements. One of these forms the turn leaving two in the dextral fringe elements. The ends of the sinistrals after crossing the upper edge form the second or upper layer of the fringe.

The fringes at the upper and lower borders range from 6 to 8 inches in length. (See Pl. XXX, *B, C, D.*) Unsplit butt strips are sometimes found in the lower fringe, due to the split individual wefts having been added as the dextrals and the united part not being subsequently split.

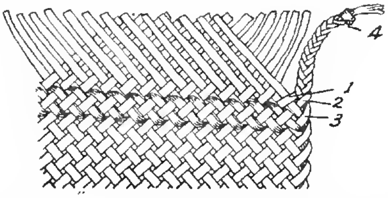


FIGURE 164.—Fine mat, upper edge finish, and right upper corner braid finish. The three-weft braid finish of the upper edge is obvious. As the upper and right edges converge, the working edge is reduced to the three working dextrals (1, 2, 3) which are plaited into a braid tail and knotted (4).

Ornamentation. The technical upper border is further embellished with two forms of ornamentation; triangles or pointed strips of the prepared weft material and rows of feathers. 1. The forms and technique of the weft material ornamentation are shown in figure 165. In one mat, a row of wide strips was sewn on about 0.5 inch from the edge and the lower ends split to augment the fringe. The lower technical border is left plain, but one mat was seen with a row of ornamental triangles at both fringe borders. 2. A fine mat is not considered perfect without a row of red feathers along the technical upper border. (See Pl. XXX, *D.*) The red feathers of the Fijian parrakeet (*Lorius solitarius*) were those used. They were probably obtained originally by barter and as reciprocal presents, but Pratt (23, p. 261) states the birds were introduced into Samoa and kept by the natives for the sake of their red feathers to ornament fine mats.

The feathers are knotted along a thread in exactly the same manner as in preparing feather kilts. (See fig. 143.) The thread carrying the feathers is laid along the base of the triangular ornamentation and attached by stitches which loop over the thread and pass through the mat. In most mats the feathers form a continuous line, but, sometimes, owing to a scarcity of feathers, short lengths are used with gaps between. (See Pl. XXX, *D.*)

The fine mats are worn around the waist as a skirt, doubled so that the technical finishing edge hangs down with the red feathers in front. The two lower edges are adjusted so that the fringe from the edge at the back reinforces those of the front. In a mat made with the triangular ornamentation on the opposite edge and opposite surface to the red feathers, the edge at the back is allowed to hang down a little lower and show the triangular ornamentation below the interior fringe. The mats are kept in position usually by a *fusi* girdle of bark cloth. (See Pl. LIV, *C.*)

BARK CLOTH

The Samoan name for bark cloth is *siapo*. The term *tapa* used in Tahiti (Hawaiian form, *kapa*), is not used as a general name for the material. Pratt (23, p. 310), however, gives *tapa* as "One of the white borders of a *siapo*." In Maori, *tapa* means the border of a garment. The Samoan use of the word is applied to the border rather than to the material.

Stair (33, p. 115) states:

> Before the contact with Europeans, and indeed for some time after, the use of *siapo* as an article of dress was confined to a few unmarried females of the highest rank, O *Tausala,* titled ladies; all others being prohibited from wearing it upon pain of heavy chastisement. The privileged few only wore it in the house. For a long time past the rule has been broken through, and *siapo* is now worn by all persons of either sex.

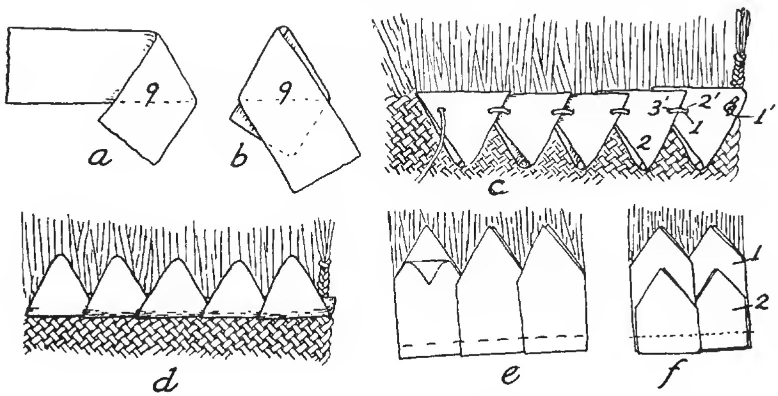


FIGURE 165.—Fine mat, triangular ornamentation: *a,* and *b,* a strip of weft material, 1.25 inches wide, is folded into a triangle 1.5 inches wide across the base (9) and cut off below the base. A sufficient number are prepared to stretch across the width of the garment. *c,* The first triangle (1) is laid on the upper surface of the mat with its base level with the upper edge of the plaiting and on the right. The thread consists of a narrow piece of weft material with one end knotted while a pointed stick was used before the steel needle to pierce holes. Stitches to attach the triangles to the garment are made through the base part about 0.25 inches from their edge. The first hole is made through the outer part (1′) and the thread drawn through to the knot. The thread passing to the left on the under surface of the garment is brought through to the front at the point (2′) well in from the left edge of the triangle. The second triangle (2) is placed in position with its right edge against the thread. The thread is passed through the overlapping part of both triangles and similar stitches made as each triangle is added on the left. The last triangle has a short stitch made over its left edge and the thread is tied at the back. *d,* The row of triangles is doubled over so that their apices are directed towards the fringe. *e,* In more modern methods, two strips of material about 1.5 inches wide, with their dull surfaces together, are cut off into 2.5 inch lengths and one end cut to a point. The strips are placed with their points towards the fringes and the square ends stitched to the plaited material with a sewing machine. The change from the folded triangles to pointed strips has been influenced by the introduction of scissors and sewing machines. *f,* A double row of longer (1) and shorter (2) pointed strips is sometimes used.

Brigham (4, p. 36), in 1911, stated that "Samoa is a group where the manufacture is still carried on, but merely for the supply of curiosity dealers and it may be supposed the work is not improving." The supposition as regards the work not improving is probably correct but it is inexact to state that even now, in 1928, *siapo* is manufactured merely to supply curio dealers. No doubt the outside demand by tourists and dealers leads to extra material being made. The continuance of manufacture is also due to the persistence of certain social customs and needs. During the Bishop Museum tour around Tutuila we were struck by the chiefs and talking chiefs appearing at the village welcomes dressed in *siapo*. The same applied to women during the *ta'alolo* food ceremonies. At a wedding ceremony in Manua, a considerable number of pieces of *siapo* figured among the wedding presents. For ordinary presents to visitors, *siapo* has taken the place of fine mats. In western Sāmoa, the Government prohibition against the giving of fine mats has led to the substitution of large numbers of *siapo* pieces at feasts, weddings and funerals. The giving of *siapo* with ceremonial kava drinking and the high chief's *sua* portion of food still persist in custom. A talking chief is not properly dressed unless he has a kilt of *siapo* as well as his orator's fly switch. Sheets are still used as partitions in guest houses and as bedding, while foreign influence is to be seen in their use as table covers in the various Samoan homes.

Though discontinued in most parts of Polynesia, bark cloth making is still an active craft in Samoa. Though there is evidence that some of the dyes have been forgotten and the wooden tablet (*upeti*) is displacing the original article made of pandanus leaves, the technical process remains the same. There are no lost secrets of the craft and the lack of exact detail in the Report of the Wilkes Expedition, that was deplored by Brigham (4, p. 38). can be supplied even now. The marked differences in some parts of the Samoan technique compared with that of Hawaii, the Society, and neighboring groups, justify a detailed description of Samoan manufacture. The outstanding features in Samoan technique are the absence of felting and the use of the *upeti* tablet for rubbing instead of printing.

MATERIALS AND TECHNIQUE

The plant universally used is the paper mulberry (*Broussonetia papyrifera*). The name in common use is *u'a,* while the other name of *tutunga* is unknown to many of the younger people. The name *u'a* is also applied to a young breadfruit tree and to a net prepared from its bark. Tradition states that the plant was brought from Fiji and that Suai-fonua brought the *tutunga* to Fonga-savaii and Faiaai in the Salenga district of Savaii.

The use of any plant except *u'a* is now denied, and breadfruit bast is restricted to making cords for a type of seine net. The paper mulberry,

planted from cuttings (*maunu*), is cultivated in the food plantations. Saplings are used while a second growth (*tuapipi*) is also utilized.

Peeling the bark. The bark was peeled (*sasae*) from the wood (*aumafuti*) and the process termed *sae u'a*. The name for any bark is *pa'u* but that of the paper mulberry was also referred to as *u'a*. The saplings now generally used are about as thick as the thumb, though smaller sticks (*'auli'i*) may be used to provide material for patching holes. Large saplings are unsuitable as the bark is too tough to beat out into sheets.

The bark is separated at the butt end, usually with the teeth, and a short longitudinal slit made down one side. It is said that the longitudinal slit must be on the convex side of any curve in the stake. The reason given is that the texture of the bark is more complex on the concave side. The bark as it is pulled off, will split cleaner on the convex side, whereas on the concave side the edges are left ragged. The bark is worked down from the butt until the left hand can grasp the freed bark. Holding the wood with the right, the bark is pulled away from the wood in a long tube which splits on the convex side from the initial cut. Towards the tip end, care has to be exercised as the projecing buds of leaves adhering to the wood tend to split the bark on either side of them and leave portions attached. Any such tendency is watched and the base of the knob pushed off with the thumb nail to free it with the bark. When the strip becomes too small, the bark is cut off.

Peeling off the bast (*fofo'e*). The bast is usually separated from each strip, immediately after stripping it from the wood. The inner bark or bast has no specific name but is referred to as *pa'u pito i totonu* (the part of the bark on the inside), as against *pa'u pito i tua* (the part outside). The strip of bark is wound around the left hand, commencing with the butt end with the inner surface outwards. The somewhat tubular strip of bark is thereby opened out and flattened.

The strip is opened out in its length and a transverse cut made through the outer bark near the butt end. The outer bark is lifted up, with the edge of a knife or a piece of bamboo, until it separates across the width of the strip and sufficiently down its length to allow the left hand to grasp it. The bast is held down on the right thigh by the right palm while the left hand pulls the outer bark away from it. The two separate quite readily along a natural plane of cleavage but care is exercised in separating with the thumb nail any portions of outer bark that tend to stick to the bast. This applies especially towards the tip end where the leaf buds are. When the tip end has run out, the strip is reversed and the portion of the butt end on the butt side of the tranverse cut dealt with similarly. (See Plate XXXII, *B*, 1.) During the separation, the strip is kept taut between the two knees, or legs. The outer bark is discarded and the bast thrown into a bowl of water. Each strip of

bark is dealt with by the above two processes before proceeding to the next stage. The second stage gets its name from *fofo'e* (to peel).

Scraping the bast. The scraping of the bast (*fai u'a* or *fafai u'a*) requires a scraping board, a number of shell scrapers, and a strip of bamboo for a knife.

The special scraping board (*papa fai u'a*) is dubbed out of *iliili* or other wood and was formerly smoothed down with coral. An average sized board is 37 inches long, 18.5 inches wide, and about 0.75 inches thick at the edges. Sometimes a piece from the side of a canoe is used.

Shell scrapers (Pl. XXXI, *B*) are referred to generally as *'asi* though *'asi* is also the name of a specific shell. Three kinds are used: *Asaphis violacea, Antigone reticulata,* and a species of *Arca*. The names applied by the Samoans vary both in districts and with the particular use of the shell.

The *'ofe* knife is merely a strip of dry bamboo about 0.25 to 0.5 inches wide and of any convenient length.

Scraping the bast is done in a stream when such is available. Otherwise a wooden bowl containing water forms part of the equipment. The board is propped up at a convenient angle against a stone or other support. The lower end rests on the ground where the worker seats herself. Though the whole process is termed *fai u'a,* the actual scraping is *valu u'a.* There are usually four stages of scraping and rubbing and a different shell is used with each stage.

Scraping (*valu u'a*). A strip of bast is placed longitudinally on the middle of the board with the butt end towards the top and the surface that was next to the outer bark uppermost. On this surface, streaks of green coloring matter adhere and the first scraping is to remove them. In Manua and Tutuila, the shell of the *Asaphis violacea* (*pipi*) is used (Plate XXXI, *B,* 1.) In Savaii, the rough untrimmed edge of the *Arca* is in vogue (Pl. XXXI, *B,* 2) except at Safune where the *pipi* is common. The *Arca* shell so used is termed *'asi valu.* A shell full of water is dipped out of the bowl and dropped on the upper part of the bast strip so that it runs down over it. The scraping is made with backhanded movements upwards and away from the body, the outer surface of the shell being towards the worker. Every now and again a shell full of water is dropped on the bast. When the green coloring matter and coarser particles of outer bark have been scraped off, the other stages of the process are completed before another section of the same strip is moved up. (See Plate XXXI, *C*.)

Rasping (*mangeo* or *pae*). The next stage consists in rasping the surface of the bast with the rough outer surface of an *Antigone reticulata* shell. (See Plate XXXI, *B,* 3.) In western Samoa, the shell is called *mangeo* and in eastern Samoa, *pae.* In each area, the process receives the local name

of the shell. The outer rasping surface of the shell is held downwards on the bast with the hinge part towards the worker. Both thumbs grasp it on the outside whilst the fingers exert downward pressure on the inner surface of the shell which faces upwards. The movements are again upwards and outwards. They loosen interfibrous material that the first scraping was unable to remove. A little water is splashed on every now and again with the shell. The surface of the bast is left rough with little particles sticking up after the rasping is completed.

Smoothing (*pae* or *fa'amalu*). This process consists of smoothing down the rough surface left by the rasping and at the same time removing any loose particles or ends. Here there is some confusion between the methods of western and eastern Samoa. In western Samoa, the *pae* is an *Arca* shell that has had its slightly irregular natural edge ground to an even sharp cutting edge. (Plate XXXI, *B,* 4.) This edge is used as in scraping. It removes the loose pieces and irregular ends. The movements are up and out and water continues to be used. The process is called *pae* which in eastern Samoa has been given to the *Antigone reticulata* shell and the process of rasping.

In eastern Samoa, the shell is also the *Arca* but the back is used as in rasping. The back or outer surface is grooved but the ridges are not serrated as in the *Antigone reticulata.* It thus acts quite effectively in removing loose particles and smoothing down the bast surface. In Tutuila, the variation existing in some villages was the use of the back of the shell continued on into the next process, whereas in others, a different shell was used. The process was called *fa'amalu* as was also the shell used for the process, though the general shell name was *'asi.*

Drying (*ta*). In western Samoa, the process of expressing as much of the moisture as possible was termed *ta.* The shell used was an *Arca* that had been ground from both sides to form an even, obtuse-angled blunt edge. (See Plate XXXI, *B,* 5.) Water was dashed on and scraped off to clean the bast. The last movements were applied with firm pressure to remove as much of the moisture as possible. The shell was held as in scraping.

In eastern Samoa, the shell used in the previous process was further utilized with firmer pressure to effect the drying purpose. The back was used and the process combined with the former was called *fa'amalu.* In some villages, however, an *Arca* shell corresponding to the western Samoa *ta* was used in the same way but was called *langalanga.*

After the section of bast has been subjected to the four processes, the strip is moved up so as to allow the next section to be done. In this manner, the strip is finished in sections. The last section with the end of the strip is reversed in direction so that the end is efficiently dealt with by the upward

sweeps of the shells. In western Samoa the scraping movements are always from butt to tip except for the butt end which has to be turned. In eastern Samoa, however, I noticed a woman doing the reverse.

In Leone, a woman used both a *pipi* (*Asaphis violacea*) and an *'asi* (*Arca*) for the first scraping process and a *langalanga* as well as a *fa'amalu* for the two last processes. She also used an *Antigone reticulata* rasp. Thus she used five different shells as against three in some villages and four in western Samoa. After the drying stage, the *fai u'a* process is completed as far as the individual strip is concerned.

BUNDLING PROCESS

Each scraped strip is folded separately into quarter lengths with the internal surface of the first quarter uppermost on the board. The *ta* shell is used on the folded strip to express as much moisture as possible. From the manner of folding, the external surfaces will be to the outside both below and above. Other folded strips after scraping are placed above the first and the whole bundle again scraped with the blunt *ta* shell after each addition. The butt end is reversed with each alternate strip so as to make the bundle as even as possible. The bundle may contain from two to seven folded pieces. The topmost one is left as folded so that the outer surface of the bast is to the outside of the bundle both above and below. The Samoans attach importance to the method of folding. The bundle is called *tapapanga u'a*. Pratt (23, p. 64) gives the alternative name of *ulututunga*.

The pressure with the *ta* shell, besides removing any extra moisture, presses the strips closer together so that they appear as one piece. The *tapapanga* bundles are put under cover of an old strip of cloth to prevent their drying before the next process, which must wait until all the bast strips have been dealt with.

The term *ta* means both washing and expressing as much moisture as possible. It is nowadays applied to the washing and wringing of textile clothing.

BEATING THE BAST

For the important process of beating out the bast (*tutu*) an anvil and beaters are required.

The anvil (*tutua*). The anvil was usually made of *toi* wood as it gave a more musical sound when beaten. An example seen in use was 5 feet 7 inches long, rectangular in cross section, the upper and lower surfaces 8.5 inches wide and the sides 7 inches. The upper longitudinal edges were rounded off. (See Plate XXXI, *D*.) Others seen in use were merely sections of a tree trunk.

A well made anvil in Bishop Museum is 6 feet 9 inches in length. The upper surface is 8 inches wide in the middle, tapering down to 6.5 inches at the ends where it is rounded off. The sides are slightly under cut and ornamented with a continuous deeply incised chevron pattern. The sides are 5 inches deep in the middle. The under side has three transverse bars projecting down slightly and serving as legs, one in the middle, and the others towards the ends. On either side of the middle leg and running out to the outer legs, the under surface has been hollowed out.

The anvils were hollowed out to give a better sound for in olden days, women amused themselves at work by beating out various rhythms. They had many signals by which they could warn one another of the approach of strangers, and conduct a limited conversation. Anvils were also made of *toa* and *ala'a* wood.

Beaters (*i'e*) were usually made of *pau* wood but some were made of *toa* (*Casuarina sp.*). The Samoans classified them into smooth beaters (*i'e mole*) and grooved beaters (*i'e tosi*). In shape, they classify readily into two types, round and foursided. Of sixteen beaters in Bishop Museum, ten are four sided, five round, and one a variation of the round type. Another term for a grooved beater is *i'e teuteu*. (See Plate XXXI, *A*.)

The round beaters are all smooth without any longitudinal grooves and are thus all *i'e mole*. They are longer than the other type, ranging from 15 inches to 17.75 inches with an average of 16 inches. In cross section, the beating part is usually elliptical though some may be circular. The beating part slopes gradually back into the handle, usually with no shoulder or abrupt change to mark any junction. The handle is much less in diameter than the blade and is usually flared out at its proximal end. (For the type beater see Plate XXXI, *A*, 1.)

The main variations may be summed up: The cross section is elliptical in four beaters, with the greatest diameter at the distal end ranging between 2.5 and 2.7 inches, the difference to the lesser diameter ranges from 0.2 to 0.4 inches. One was circular.

Between the beating part and handle, one beater out of five had a distinct shoulder 7.5 inches from the distal end, the beater being 16 inches long. The others had no trace as the slope was gradual.

The cross section of the handle was circular in three being 1.3 to 1.4 inches diameter. The largest beater had a difference in two diameters of 0.1 inch with the longest diameter 1.6 inches. The smallest had a difference of 0.3 inches.

Flaring of proximal end of the handle was present in two out of five.

The four-sided beaters are shorter ranging in a series of nine from 11.5 inches to 15.25 inches. They are practically square in section, with the four surfaces narrowing towards the handle. The slope from the beating part to

the handle is gradual and while the junction between the two parts is fairly distinct, it is not abrupt except in one abnormal form. The handle is circular in cross section but may have a slight difference in two diameters. The proximal end of the handle is usually flared. The beaters may be smooth on all four surfaces (*mole*), or grooved longitudinally on from one to three surfaces. In none of the beaters were all four surfaces grooved.

Smooth beaters (*i'e mole*). A typical beater (c. 354) not figured is 12 inches long. The cross diameters at the distal end are 2.3 and 2.2 inches. The end is cut off square. All four surfaces narrow gradually towards the handle and at the indistinct shoulder, both diameters are 1.7 inches. This point is 7.25 inches from the distal end. The handle narrows down to cross diameters of 1.5 and 1.35 inches. The proximal end of the handle flares out to cross diameters of 1.9 and 1.8 inches. The beater is smooth throughout and is 27 ounces in weight.

Of two other beaters in this sub class, one conforms closely to the type beater, but the other is very long. (See Plate XXXI, *A*, 4.)

Grooved beaters (*i'e tosi*). Of seven grooved beaters, one is grooved on one surface, five on two surfaces and one on three surfaces. The type beater is shown in Plate XXXI, *A*, 5.

The cross section of the beating part is practically square, there being a difference in the two diameters at most of 0.1 inch and in one case of 0.15 inches. Leaving out the special small beater, the distal diameter ranges from 2.6 to 2.9 inches with an average of 2.7 except for an abnormally large beater which has distal cross diameters of 3.2 and 3.1 inches.

All surfaces narrow towards the proximal end; none have parallel sides. By dividing the length of the beating part by the difference between the width of the distal and proximal ends of the beating surface a slope index is secured. Thus in the type beater (c. 760), the length of the beating surface is 7 inches and the difference between the two ends 0.7 inches. The index of slope is thus 1 in 10, which is a fair indication of the slope in these beaters. The beating surfaces average about 7 inches in length. At the distal end they range in width from 2.5 to 3.1 inches. At the proximal end, they average slightly over 2 inches ranging from 1.8 to 2.5 inches. The beating surfaces are thus marked by comparative short length, extra width, and by narrowing towards the proximal end.

The grooves are deep and wide but badly cut as they are often irregular at the edges. In one beater, the proximal ends of the grooves are cut off square in line with each other. In the same beater, the ridges formed by the grooves are rounded off. (See Plate XXXI, *A*, 7.) The beater with one grooved surface has eight grooves. In the five beaters with two grooved surfaces, the grooves are distributed as follows: 5+5, 5+5, 5+6, 5+8 while

in the beater with the widest surfaces they are 6+8. In all except the very small beater, the grooved surfaces are opposite each other. The beater with three grooved surfaces has 5 grooves on each surface. Thus 5 grooves per surface is the usual number and the most is 8. The grooves are thus very widely spaced as compared with those of east central Polynesia and Hawaii. As the same grooves vary in their distance apart owing to convergence at the proximal end, they cannot be calculated in numbers per centimetre. It may be stated, however, that at the closest they are 6 mm. apart and at the widest 11 mm.

The handles are approximately circular in the narrowest part, there being a difference of 0.1 inches at most in cross diameters. The diameter ranges between 1.3 and 1.6 inches except in one rather thin long handle where it is 1.1 and 1.2 inches in cross diameter. At the junction with the beating part, the slope is gradual and in some form a rather indistinct shoulder. In one abnormal case (Pl. XXXI, *A*, 7) there is first a distinct bevelled shoulder with the beating surfaces and then a perpendicular cut down to the handle, which is thinned down to the same thickness throughout. The proximal end is flared in five out of seven beaters, the increase being 0.2 to 0.3 inches more than the narrowest diameter of the handle but in the most marked flaring, the proximal end has cross diameters of 2.3 and 2.1 inches as against the circular diameter of the handle of 1.6 inches. The slope of the flare runs evenly up at the end making a sharp acute angle with the rim but in two beaters the rim was found to be trimmed off.

Large grooved beater with shoulder. The beater (Pl. XXXI, *A*, 7) with wide surfaces, the cut away shoulder and long shaped handle is exceptionally large and heavy. The distal end surface instead of being flat or slightly convex, is cut in pyramidal form by carrying four surfaces down from the beating surfaces to meet in a middle point with four distinct edges running from each corner to the middle point. The projection of the middle point is nearly one inch. This feature, combined with the cutting of the shoulder and shaping of the handle, shows a marked departure from normal due to the excessive use of a steel tool.

Smooth beater of triangular section. The beater in Plate XXXI, *A*, 3 is 14 inches long and 30 ounces in weight. The beating part is triangular in cross section with the longitudinal edges between surfaces rounded off. At the distal end, the narrowest surface is 2.5 inches and each of the others 2.75 inches.

The beating surfaces shape gradually into the handle which is flared at its proximal end. It is smooth throughout. The beater is a variation of the round type of *i'e mole,* the triangular section being most probably influenced by a natural tendency of the wood in that direction.

Small grooved beater (Pl. XXXI, *A*, 8) is a departure from normal size. The owners gave Mr. A. F. Judd the name of *i'e tusitusi* for the beater but could give no other information as to any special use. As *tusi* means to mark *siapo,* this specially light beater may have had something to do with the beating down of the cloth on the dyeing tablet as mentioned by Ella (11, p. 168).

Foreign type. The beater figured in Plate XXXI, *A,* 9 was obtained on the island of Ofu, but no history could be obtained.

The *tapapanga* bundle, still damp, is placed lengthwise across the anvil and beaten evenly with the *i'e* beater. The margins and then the middle were beaten so that the thinning and spreading went on evenly by gradual stages. When the package was fairly thin, it was doubled and again beaten thinner. It was then opened out and the bands or creases at the folds which were slightly thicker were beaten to make the material of an even consistency. They were again folded and beaten. The grooved sides of the mallet were used first and the smooth sides as the material got thinner. The beating continued until the expert judged that the material was thin enough. (See Plate XXXII, *B,* 3.) The various packages prepared were all beaten separately before going on to the next process. The beaten material was meanwhile kept under cover of a sheet of bark cloth to prevent it drying too soon.

From the description of the scraping and folding, it will be understood that the strips of bast though damp were, speaking comparatively as regards the proceedure in parts of Polynesia to the east, fairly dry. Hence when the packages were beaten there was no felting of the strips together. On opening out the beaten bundles, the material formed from each strip came out as a separate and distinct sheet of thin cloth. They were long and narrow, wider at the butt end and thus conforming in shape with the nature of the strip. Towards the tip end, there were usually holes that coincided in position with the parts formed by flaws in the bark made by the leaf buds. Thus at the end of the beating process, the number of sheets of thin cloth corresponded to the number of strips of bark contained in the packages.

STRETCHING

Before the material is dried, the individual sheets have to be stretched while still damp. This distinct process is termed *lelenga.* The *tapapanga* beaten bundle is removed from cover and each individual sheet unfolded (*tala,* to unfold). The first one is laid out to its full extent on the ground and is called the *lafi lalo* (the lower cover). Succesive sheets are opened out and laid out above one another with the corresponding wide parts at the same end. Each sheet is thrown out (*lafo,* to spread out as in spreading ordinary sheets). This is continued until from 14 to 20 sheets are in one bundle. The

whole bundle is called *ulu u'a* and the uppermost sheet, *lafi lunga* (the upper cover). The term *lafi* means to hide so that the *lafi lunga* and the *lafi lalo* sheets hide the pile between them.

A row of stones to act as weights is placed on the upper cover along the middle longitudinal line. All the sheets on one side of the stones are doubled over the row of stones so that half of the lowest sheet is on top with the others in consecutive order. The top half sheet is turned back into its original position and pulled and stretched to remove all folds and wrinkles. Each half sheet is dealt with similarly by taking them in turn from the top of the pile and replacing them in position ere stretching them. The sheets being still damp stretch easily and retain their shape when released. When all the half sheets are so dealt with, the other side of the bundle is doubled over the row of stones. Each half sheet is similarly dealt with so that on completing the *lelenga* process, each sheet has been fully stretched in a simple and effective manner.

DRYING

The term *fa'ala* is to dry in the sun (*la*). The *ulu u'a* bundle is taken out into the sun after removing the row of stone weights. They may be left in one pile or separated into smaller piles.

Stones are placed on the ends to prevent their being blown about. When dry, the sheets are folded up, wrapped in a sheet of bark cloth and stored to await the other processes of technique.

The sheets are thin and white and are called *lau u'a,* now generally pronounced *lau'a.* Pratt (23, p. 156) states that *lau u'a* is synonymous with *tutunga* for which word it has been substituted on account of superstitions in connection with fishing.

CLOSING THE HOLES

Attention has been drawn to holes unavoidably present in the *lau'a* form of beaten cloth. The process of closing them by means of patches is called *puni u'a* for short but the full name is *puni mata o le u'a.* The term *puni* means to close, and *mata* is really the mesh of a net. In the thin cloth, the crossing fibres of the material are plainly perceived. The holes show as openings between the fibres, hence the naming after the meshes of a net. The expression *puni mata o le u'a* means closing the meshes of the cloth.

The pieces of *lau'a* may be dealt with after they are dried or at some other convenient time. Sometimes they are closed immediately before the dye is applied or while the actual pieces are being stuck together to form the thicker cloth. The closing of the holes is done with patches of *lau'a* which are stuck

to the material with a glutinous substance. The materials required are a board, the glutinous material, a bamboo knife, and the patching material.

The board (*papa*) may consist of the *papa valu* upon which the bast is scraped or the board upon which the cloth is dyed. A board must be used, but a special one is not necessary for patching alone.

The glutinous material seen in use consisted of three kinds but Pratt (23, p. 324) mentions a fourth.

1. Arrowroot (*masoa*). The tuber of the arrowroot is washed and cooked in an oven. It then forms a ball of paste which may be dipped every now and again in water to moisten it. This is the usual form but a woman was seen using a cooked ball of the prepared arrowroot which she dipped in water before applying it to the cloth.

2. Breadfruit (*'ulu*). The over ripe breadfruit is very sticky and tenacious. The top of the fruit is removed and the rind acts as a natural glue pot containing the softened over ripe fleshy material. To apply it, a longitudinal section of coconut husk is used as a brush. The outer skin of the husk cnvelope is left attached, and the section is about 0.5 inches to 1 inch wide, 0.25 inches thick, and a few inches long. One end forms the handle and the other end is cut off square. The sticky material is thick, very white, and has a strong odor. On asking a woman who was using another material why she did not use breadfruit, she said that the unpleasant odor attracted too many flies. The *'ulu uea* is the best kind of breadfruit for paste. Some varieties are not suitable.

3. *Pipturus propinquus* (*fau songa*). The *fau songa* is the plant whose bark furnishes the best material for lines and cords. The bark contains a copious, clear gum which exudes freely when the bark is cut. The woman seen using it, had a number of narrow strips of bark a few inches long which had been sliced from the tree. They were arranged in a wooden bowl with a little water in it and with the inner or bast surface upwards. On the bast surface, the exuding sticky gum had formed quite an appreciable layer. In using, she took up a piece of bark, applied its inner sticky surface to the material and wiped the gum off on it.

4. *Cordia aspera* (*tou*). Pratt (23, p. 324) states that the berries of the *tou* were used as a paste in making *siapo*. No information was obtained from native sources. It was formerly used as a dye, but Pratt's use of the word "paste" would seem to indicate that he meant the sticking together of material in the making of *siapo*.

The bamboo knife was seen in use at Vaitongi, Tutuila, for cutting patches. The small sheets obtained from the thinner *'auli'i* saplings are beaten for patching material.

The technique of patching is simple. The woman examines each *lau'a* sheet and draws the hole over the middle of the board. She smooths out and flattens the sheet. Judging the size of the hole she cuts out a piece of *lau'a* from the patching strip, taking care to allow for an overlap. She lays the piece over the hole to verify the size. If too large, she trims it down to suit. She then applies the glutinous material to the upper surface of the *lau'a* sheet around the margin of the hole. The patch is simply dabbed down on the material and pressed with the open palm to close the *mata*. The glutinous material is never applied primarily to the patch. The edges of the hole, if ragged are trimmed with the bamboo knife.

THE COMPLETION OF SIAPO CLOTH

A completed *siapo* cloth is an assembling of sheets of *lau'a* joined together into various sizes and various thicknesses by sticking them together with one or other of the glutinous materials already mentioned in the patching of holes. The various sizes and thicknesses receive particular names but they are all *siapo*.

A single layer of *lau'a* termed *lau'a tasi,* is worn by young men. It is generally smeared or painted with the red-brown *'o'a* dye.

PLAIN SIAPO

The finished *siapo* before it leaves the hands of the craftswomen is always colored with various dyes. There are two methods of applying the dyes; one to each *lau'a* sheet that forms the thickness of the *siapo,* and the other to the last sheet that is added. In the latter process, the full size of the sheet is made in plain material before the painting of the upper outer surface is commenced. The material required is a board and the glutinous material.

The board (*papa*) used is that on which the painting of the *siapo* is usually done. It is generally formed from a portion of the hull of an old canoe. One examined was 67 inches long and 18 inches wide over its transversely convex surface.

The glutinous material is any one of those mentioned, but for plain cloth breadfruit is commonly used. It makes very white *siapo* which is fairly stiff (*'otu 'otu*).

The first *lauu'a* sheet is laid over the board with the widest part from the butt end of the bast towards the worker and its length transversely across the board. The section on the board is then painted over with the breadfruit paste leaving a fair margin on the right border of the sheet. The second sheet is placed carefully upon the first and the part on the board rubbed evenly to make them stick together. The upper surface of the second sheet is next pasted with the paste over an area corresponding with that pasted on the first. A third sheet of *lau'a* is now carefully applied and rubbed evenly to make them stick together. Three thicknesses are usually enough but a fourth and then a fifth sheet may be similarly applied according to the thickness required. In this description, three will suffice. The worker may now move the stuck sheets to her left or move along the board. It will be noted that the ends of the sheets beyond the board are separate as are also the side margins on the right. On the right, the free margins of the two upper sheets are folded back over the united part. The margin of the lower sheet is painted with paste for the width of the board. A sheet of *lau'a* is then reversed so that its narrow end is towards the worker. Its left margin is carefully overlapped over the pasted part of the first sheet and carefully rubbed to join them together. The section of the new sheet on the board is then pasted, care

being taken to carry the paste back as far as the line of adherence between the first and second sheets on the left. The free right margin of the second sheet on the left is then turned down and stuck. The upper surface of its right margin is also pasted. A second sheet with its narrow end towards the worker is then placed in position on the pasted surface and stuck. The upper surface of the second layer on the board is pasted as before as far to the left as the line of adherence between the second and third left sheets. The right margin of the third left sheet is turned back and straightened out over the pasted part. A few touches of paste are given to the upper surface of its right margin and a third sheet placed in position. The right margins of the second set of three sheets, which have been left unpasted are folded back, and a third set of three dealt with in the same manner. In this manner, sheets are added on the right until the desired depth is reached. Instead of dealing with widths of one sheet of *lau'a,* two or three sheets may be dealt with at once to make a convenient working width. The principle of marginal overlapping is, however, the same.

When the depth has been obtained, the stuck portion is rolled or folded longitudinally with the length of the board so as to bring another section of the free parts on the other side of the board into position on the board. Commencing at the left margin, the far ends of the sheets are folded back towards the worker. The lowest sheet is left on the board. Its upper surface is painted with paste for the section on the board. The line of adherence is now transversely on the near edge of the board. The worker sees to it that this transverse line of adherence is actually on the board. The second sheet is then turned forward over it and rubbed down. The right margins as before are left free of paste. The second sheet is smeared with paste except for the right margin and the third or upper sheet turned forward and stuck down. The next set of three on the right are dealt with successively as before. Here, however, there is now a line of adherence on the near side as well as the left. If the sheets of *lau'a* fit well through the alternate reversing of the sheets, when first stuck together, the margins will overlap quite well. Should there be any gap, a piece cut to the appropriate size is fitted in. When the second segment of pasting has been completed, the pasted part is further rolled to draw the next unpasted segment on to the board. Commencing on the left, the process is repeated until the required length is secured. If the length of the sheets of *lau'a* is not sufficient more material is joined on end to end in exactly the same way as side to side joining.

The fa'apa'o'o process. In the method of preparing the bark that has been described, it will be noted that the bast is separated from the outer bark without previous soaking in water. The bast separates quite readily as I have personally observed on several occasions. Pritchard (24, p. 130), however, states:

> The tree is cut down, the bark peeled off, and soaked for forty-eight hours in water. The outer or brown bark is then separated from the inner or white, and the woody parts of the latter removed by scraping with a particular kind of shell.

The present day Samoan, however, denies that the bark was soaked beforehand as a necessary introduction to the scraping and beating of the bast. It is only done according to them when the bark cannot be dealt with immediately after it is brought in from the plantation. This occurred in past times when the paper mulberry was grown more extensively than now. When a large quantity of saplings matured at the same time, they were all cut to save the bark from becoming too old and thus useless for cloth. The bark was stripped and the bast separated (*fofo'e*). When the quantity of bast was too great to be scraped and beaten at once, it was stored away to await a convenient time. Before dealing with such stored bast which had become dry, it was soaked overnight in water if the *fafai* process of scraping was to be carried out on the following day. The scraping and beating were then exactly the same as that already described for the fresh bark. The material produced was termed *u'a fa'apa'o'o* to show that the *u'a* had been kept till it was dry instead of being beaten when fresh. The term *pa'o'o* means the dried gills of a fish such as the bonito which were used as a shark bait.

The Cook Islanders soaked the separated bast for twenty-four hours in water before beating it. Pritchard had been British Consul in Tahiti before going to Samoa and he may have confused the technique of that area with that of Samoa.

Joining technique. In the now prevailing technique, the individual sheets obtained from each strip of bast are stretched by the *lelenga* process before they are dried. They are joined together with arrowroot or other material after having been dried.

Pritchard (24, p. 130) again gives a different method as follows:

> The bark is procured from the plant in strips of three, four or five inches wide, but by scraping and beating it is spread out to some ten inches, and made so thin that it is quite transparent. Several pieces are then put together, over each other, according to the thickness of the cloth required, arrowroot being used to make them stick together. The strips are then put together in widths to suit the purpose and beaten again, until they are made into one. The whole is then dried in the sun.

Again one cannot help thinking that confusion in the detail of Samoan technique has occurred through unconsciously transferring ideas formed in another area, or general deductions made through not carefully observing each detail in its proper sequence. The latter contingency would arise in regard to cloth making with any general observer who was not forced by special circumstances to carefully record the technical details of each stage in the manufacture.

DYES

VARIETIES AND METHODS OF PREPARATION

Before describing the other process of making *siapo*, it is necessary to deal with the various dyes. The plant dyes in common use at the present time are a reddish-brown (*'o'a*), red (*loa*), yellow (*ango* and *lenga*), and black (*lama*). A red earth (*ele*) is extensively used. A number of others that have gone out of active use are mentioned by various writers.

The 'o'a dye (*Bischoffia javanica*). The *'o'a* dye procured from the bark of the *Bischoffia javanica* gives a reddish-brown color and is the one in common use. The bark is scraped with a shell by women from the growing tree and falls into a coconut leaf basket placed in position at the foot of the tree. Many *'o'a* trees may be seen growing with the trunks showing the scarifications made by dye gatherers. The baskets of bark shreds are brought home where the wringing takes place.

The *'o'a* wringer (*to tau'o'a*). The *to tau'o'a* acts as both strainer and wringer, hence *to*, a strainer, and *tau*, to wring. Another name is *unu*. It is a long plaited band made of strips of *fau* bast. A wringer presented to Bishop Museum by Fuimaono of Aaloau, Tutuila is 7 feet 4 inches in length and varies in width from 12 inches at the ends to 14 inches in the middle. The wefts range from 5 to 10 millimeters in width and are 2 mm. in thickness.

The plaited band as shown in Plate XXXII, *C* is square at one end and finished off with a number of three-ply braided tying cords at the other. The plaiting is in check and commences at the left corner of the squared end in much the same way as the commencement of the *'ie fau* garment in figure 153. In the wringer, however, there are no complications with adding fringe elements. (See figure 166.)

The dye is prepared by women in the vicinity of the cooking house. The basket of bark shavings, the wringer, some banana leaves, a wooden bowl, a stout stake, and a cross beam of the cooking house are all that is required.

The banana leaves are spread on the ground for the length of the wringer. The wringer is stretched on the banana leaves and opened out. The bark shavings are distributed over its length as shown in Plate XXXIII, *A*. Less material is placed at the ends. The side edges of the plaited band are then folded over the material and made to overlap. To the middle of one side edge a couple of lengths of sennit braid are attached by one end. These are run spirally round the folded wringer towards each end and tied. The wringer with the contained material now looks like a huge sausage. Two women, holding the ends carry the wringer beneath one of the cross beams (*utupoto*) of the cooking house. The square end is placed on the beam with the slightest overlap. Holding it in position, the other end is raised and placed over it from the opposite side. The braided ends are used to tie the two parts

together just below the beam. The sausage like band hangs in a long loop. A stout stake is passed through the lower end of the loop and women holding each end walk round and round to twist the wringer. A wooden bowl is placed below. As they walk slowly round, the women put a good deal of weight on the stake so as to keep the wringer taut and prevent it buckling up. The beam over which the wringer is supported is called the *unualunga* and the lower stake used as a handle, *unualalo*.

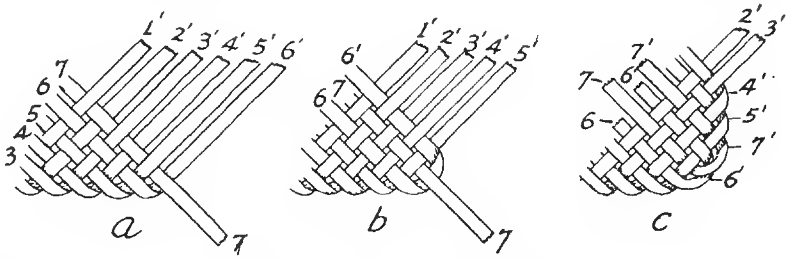


FIGURE 166.—Dye strainer (*to tau 'o'a*), plait technique: *a*, the lower border is carried on by bending up each newly added sinistral weft (3 to 7) to act as a dextral (1′ to 6′); *b*, To form the right corner, the last weft (6′) which has been turned in under the sinistral (7) to act as a dextral is again turned through a right angle to function as a sinistral. It has been crossed with the check technique at the working edge. *c*, The sinistral (7) is now turned through two right angles to pass under the dextral (5) and along the working edge as a sinistral (7′). The corner is established and the other dextrals (5′, 4′) successively turned into the left to define the right edge of the band. The full width of the band having been obtained by defining the left and right corners and the side edges, the plaiting proceeds along that width. The same width is maintained by turning the wefts in as they reach the side edges. The width varies as stated from 12 to 14 inches, the greater width in the middle being obtained by using wider wefts and not increasing the number. When the length of 7 feet 4 inches is reached, the wefts are plaited into three-ply braids. At the finishing edge of the band figured, there were 70 wefts including dextrals and sinistrals. These were plaited into 12 braids, the number of wefts varying in each braid from 4 to 9. Plaiting commenced on the left of the even edge by taking a number of wefts, dividing them into three plies, and plaiting the braid which ranged from 16 inches to 38 inches. This was continued across the edge until all the wefts were used up and the 12 braids thus formed.

As the pressure takes effect, the liquid simply pours out of the wringer and runs into the bowl. When the liquid ceases to run, the women reverse and walk round in the opposite direction. Again when the pressure is felt, another lot of liquid runs down. The pressure is kept up steadily until no more liquid can be obtained. The wringer is taken down and the drained bark refuse discarded. It burns well when dry. The rest of the material is dealt with similarly.

It is surprising the amount of liquid that is obtained from the bark. The bark has to be dealt with the same day as procured. No water is added to the bark as it weakens the dye. The liquid is stored in large coconut shells similar to those used as water bottles. (See Plate XXXII, *D*, 1.) It is

corked with dry banana leaf and will last some time. The fluid is reddish-brown in color and forms the full dye, nothing being added to it.

Besides being used by itself it is used with the black dye from the soot of the candlenut and also with the yellow dye.

The loa dye (*Bixa orellana*). The *loa* is an introduced tree but the bright red dye obtained from the seeds is simply squeezed with the fingers in a wooden bowl or a half coconut shell. It has to be used when procurable as there is no method of keeping it for any time.

The ango and lenga (*Cucuma longa*). The turmeric plant (*Cucuma longa*) is called *ango* as is also the root and the dye obtained from it directly after grating. The turmeric powder obtained by a complicated process from the root is called *lenga.*

The terms *ango* and *lenga* are quite distinct and must not be confused: *a,* in making *ango,* the root is grated and used directly by mixing with water when it gives a dull yellow color, or with *'o'a* when the yellow is much brighter. This is the usual form used for dyeing cloth in both the rubbing and painting processes. *b,* The making of turmeric (*lenga*) is a complicated process that is carried out by a number of women. It is never an individual effort. When carried out by a family, it is termed *fainga*; by the village, *nuanga.* Like other communal activities it was marked by a set routine accompanied by prohibitions as well as feasting and enjoyment.

A house is set apart as the *fale nuanga* and an enclosure of *pola* mats made round it. A small *paopao* canoe is carried up into the house and the apparatus set up for grating the root. A skilled woman is appointed *sisili* (director of the work). Meanwhile preparations for a feast are made by the menfolk.

Gathering the root. Parties of women go out into the bush and dig up the roots with pointed sticks. The baskets of root are carried down to the seaside and washed. The roots are then scraped within the enclosure with *pipi* shells. The material being ready, the process is as follows:

Grating (*ngungu*). Special graters are prepared from poles about 1.5 inches in diameter. Five or six of these are attached at intervals to one gunwale of the *paopao* canoe placed within the house or *fale nuanga.* The poles slant obliquely across the hold of the canoe and the upper ends are attached to a convenient part of the frame of the house. The lower parts that are above the canoe hold are closely wrapped for about 18 inches of their length with sennit braid, which supplies the grating surface. Above the sennit surface, a banana leaf is tied so that it hangs vertically down against the inner surface of the far side of the canoe hold. The leaves prevent the grated material from falling outside the canoe receptacle. A woman sits down beside the lower end of each pole. Using both hands, the *ango* roots are rubbed against the under surface of the sennit grater and the gratings fall down into the canoe. The usual term for grating is *olo* but the grating of turmeric receives the special name of *ngungu.* When a sufficient quantity has been grated, it is strained.

Straining (*'po*). The strainer (*po*) is formed of three or four stakes set upright in the ground to form a triangle or square. Coconut leaves split longitudinally down the midrib are used to form an upper continuous rim. The hanging leaflets are gathered

together below in the middle and their tip ends tied together to close the bottom. Selected large strips of the textile-looking material (*lau'a'a*) from the base of coconut leaves are used for lining the inner surface of the strainer. The edges of the pieces are made to overlap and the edges are sewn together with strips of *fau* bast. A pointed stick is used for piercing holes through the material. The strainer is called a *po* as is also the process of straining. Another small canoe or a large wooden bowl is placed below the strainer.

The grated *ango* from the first canoe is placed in the strainer. Water is added and the mass worked with the hands (*lomi*). The liquid part strains through the fibrous lining of *lau'a'a* into the vessel below. When the grated material has been treated, the liquid in the vessel or vessels is allowed to settle. The refuse within the strainer is cleaned out and discarded.

Decanting the water. As the liquid settles in the vessels, the heavier extract from the *ango* sinks and the water used in washing through the strainer rises to the top. The water is then decanted by tilting the vessel.

Decanting the *lenga*, *fa'amămā*. The *ango* extract left in the bowl divides into a thicker lower layer (*malasina*), and a thinner, lighter layer (*lenga*) which floats to the top. The process of separating these two layers is termed *fa'amama*. The *sisili* or director here assumes direct personal control. She uses a coconut cup with a hole in the bottom as a dipper. An empty bowl is placed beside that containing the liquid. The latter is carefully tilted and the upper layer of *lenga* slowly decanted into the second bowl. Some bowls used to contain *ango* are made with a short spout and some have merely a groove cut at the narrower end. These forms facilitate the pouring off of the *lenga* but ordinary bowls are also used. The *sisili* dips up the liquid in her cup and allows it to run back into the bowl to keep the *lenga* in motion and assist in running it off. The expert judgment of the *sisili* is exercised in deciding when all the *lenga* has been poured off. On completion, the *lenga* is in the second bowl and what remains in the first is the *malasina*. The above process is referred to in the saying, "O le atete'a nei lenga ma le malasina" (The *lenga* is being separated from the *malasina*), which is quoted metaphorically when selections and divisions are being made.

Use of *malasina*. The thicker *malasina* is not used as a dye but it is cooked for food, by dropping heated stones into it.

Cooking the turmeric. The yellow turmeric is prepared by cooking the liquid *lenga* that has been decanted. Stones are heated in an oven. The firewood used is always breadfruit. As a fierce heat is not required, only the small branches (*lala*) of the tree are used.

A number of half coconut shells are cleaned and prepared as containers for the liquid *lenga*. The half shells used are always those which contain the *mala* depressions at the end. The single *mata* is pierced with a coconut leaflet midrib and cleaned out so that each cup has a hole through the bottom. The holes are plugged with strips of banana leaf to close them.

The heated stones are arranged in threes with the *iofi* tongs to form stands upon which the round cups may rest securely without spilling. The *sisili* fills the prepared cups with *lenga* and they are placed on the heated stones. The cups are lastly covered over with leaves such as those of the *fau pata* and left for an hour.

On removing the oven leaves, the *lenga* is found to have solidified within the cups. The plugs are then removed from the bottom of the cups. The cups are inverted on the palm of the hand and by blowing through the holes, the

lenga comes out in perfect molds the shape of the shell cups. They are then dried (*fa'ala*) in the sun. The dry *lenga* is wrapped in thin *lau'a* cloth and stored. Care must be taken both in wrapping and in storing as the material easily crumbles into powder.

When thus prepared *lenga* is a rich, deep yellow in color. When crumbled, it forms a fine powder, which was formerly much in demand.

Uses. Cloth dye. For dyeing *siapo,* the grated material in the form of *ango* is that in general use. It satisfies the purpose and can be readily prepared in the quantity required by the *siapo* maker who also avoids the complicated manufacture of real *lenga.* When made *lenga* serves other important purposes not served by *ango* and it is usually kept for those purposes. When I asked some women if they used *lenga* for dyeing *siapo* they returned a negative answer. When I triumphantly pointed to the yellow color used on some of their *siapo,* they said it wasn't *lenga* but *ango.* It was not until the whole process of the preparation of *lenga* had been explained that I could understand that the yellow dye was not *lenga.* Although it is not usual, *lenga* may be used with *'o'a* to produce a fine yellow dye.

Ornamentation. The yellow powder mixed with coconut oil is used for rubbing on the body for ornamentation.

Medicine. Mixed with oil, it is used for rubbing on inflamed parts. It is especially used to rub over recent tattooing to sooth the painful parts.

A usage formerly in vogue is *lenga o le matua* (the *lenga* of the father). When making *lenga,* a family provides one very large shell cup to form a mold. The *lenga* prepared in it is carefully stored away against the time of death of their father.

When that time arrives and the mourners have taken their place beside the corpse, the family produce the special piece of *lenga* and hand it to the mourners with the announcement, "O le lenga o le matua" (The turmeric of the father). The mourners then smear themselves with it as a sign of mourning. Such provision beforehand is regarded as *fa'aaloalo* (high respect for the deceased) and the dutiful offspring gets much credit from the public. The beneficiary, while alive, also derives a certain satisfaction from his present status being respected as well as the more melancholy one that part of his future has been provided for. The *lenga o le matua* is never given away or used for any other purpose but distribution to the mourners.

Babies. Turmeric is still used as a dusting powder for babies.

The *nuanga* process of making turmeric is regarded as an important event by the community. The womenfolk enjoy it as it is one of the few occasions upon which they rule the proceedings. Singing and dancing goes on. The young men come to assist those to whom they are paying court. They do the menial tasks in order to have the opportunity of penetrating behind the walls

of the *pola* enclosure. A feast is prepared and pigs are killed for the *sisili* who is head of the organization.

A further indication of the importance of the occasion is that a number of things are *sa* or prohibited.

1. In preparing the oven for the feast, any stones that are scattered about the edge must not be replaced. The *umu* is not trimmed.

2. In grating coconuts for the coconut cream which accompanies feasts, the parts known as *tuatua* that stick to the shell, must on no account be eaten. The grated nut, after straining off the cream, must not be thrown on the fire or the *lenga* will become dirty.

3. Grimacing, even in fun, must not be indulged in or the *lenga* will not solidify.

4. Crying is repressed. If anyone cries, the *lenga* will cry also (*tangi le lenga*) and consequently will not solidify. The phrase, *tangi tangi le lenga* (the *lenga* is crying), is used for crying babies and originates from the above idea.

5. The person for whom the *lenga* is being made must not eat by himself any delicacies he may have, such as fish. If he does, flaws will appear on the *lenga* after removal from the molds. The flaws take the shape of fish or the articles that have been consumed secretly.

In connection with the last prohibition, it should be explained that a chief may ask that *lenga* be prepared for him. He and his family are then responsible for the entertainment of the workers including the supplying of food for the feast. When the idea originates in the family, the prohibition applies to the head of the family.

The above prohibitions are good examples of sympathetic magic even to the contortions of the face causing movements of the *lenga* within the molds and thus preventing it from solidifying. They form good excuses for the accidents likely to occur through bad work or ill judgment, dirt, failure to solidify, and flaws in the solidified shapes. The prohibition against secret eating was also to prevent such an occurrence depriving the workers of the choice articles of food. The same idea was carried out by the guild of carpenters when they prohibited the house owner from giving away presents, mats, or food during the construction of the house. The builders retaliated by abandoning the work and leaving a flaw in the building. The turmeric makers threatened a flaw in the shape of the turmeric they built up in the shell cup.

Some districts were famed for their turmeric. Such a one is Siu Fanga in Savaii where the custom of the "Turmeric of the Father" still exists and where these details were obtained.

The lama (*Aleuritea molucanna*) is a black dye obtained from the soot of the seed kernels of the candle nut tree also called *lama*. The material is generally prepared in quantity by a number of women banded together into a working party. The hard-shelled nuts are gathered in baskets from beneath the trees and cooked in an oven where it is left for one or two days. The nuts are then cracked between ordinary stones and the kernels threaded on dry coconut leaflet midribs (*tuaniu*) in the manner of preparing the lighting sometimes used in houses.

A building of the cooking-house type is set apart for the preparing of the *lama*. The sides must be closed so as to exclude any wind. Within the house a special fireplace is built of stone. The sides and end are built up and flat stones with a rough surface are laid across. Within this fireplace the candle-nut kernels are lighted and the fire kept going by adding the prepared skewers of nut kernels. The nuts are very oily and burn readily, emitting a black, oily smoke. There may be more than one fireplace, according to the number of the party. Women tend the fire in relays, for it must be kept constantly going. The fine black soot adheres to the surface of the stone. When enough soot has accumulated, the cross stones may be removed and the soot scraped off onto a banana leaf. The stones are replaced and the fire kept going again. The work often lasts through the night.

The soot is stored in large-sized coconut shells which are then called *pupu lama*. Enough is prepared at one time to supply the family group.

The dry powder, when used, is mixed with *'o'a* dye and not with water. The *lama* is poured into a half-coconut shell and usually rubbed with a stick as a pestle to break up any lumps that may have stuck together. The *'o'a* is poured in and a mixture made. The dye is perfectly black and the *'o'a* gives it a shiny appearance. It is used for painting the *siapo*.

Red earth (*'ele*) is obtained from some parts of Tutuila near Lei especially, and Uapato near Fangaloa in Upolu is famed for the quantity of its *'ele*. The material was dug up in lumps with a pointed stick in olden days and it was quite an expedition to obtain it in some of the rougher country. Even now *'ele* passes round in the way of trade to the districts that have none. To a *siapo* maker, her lump of *'ele* is an important adjunct.

The *'ele* is rubbed on the back of a *mangeo* shell (*Antigone reticulata*) and the powder dropped on the surface of the *siapo* as it is being rubbed. The lump is moved about so that the powder is evenly distributed. It is then rubbed over the surface with a piece of bark cloth dipped in *'o'a*. The *'ele* is generally used with *'o'a* and brightens up the color into a more reddish or brick-colored tint. It is never mixed with water or other liquid beforehand as a pigment.

The shells seen with the red *'ele* on them are graters and not containers of the powder. The *'ele* is kept in lumps and only grated as required onto the surface of the *siapo*.

Soa'a (*Musa sp.*, plantain) gives a purple dye. The trunk of the plant is cut through and the sap allowed to drip into a coconut-shell cup. It is used for painting and not rubbing.

Other dyes. Stair (33, p. 145) maintains that a black color was obtained by burying the article in the soft mud of a taro patch formed in a swamp. No information was obtained as to whether the material was subjected to any preparatory treatment with a bark infusion. The Maori of New Zealand used

black mud from swamps extensively in dyeing fibre and flax for their clothing, floor mats, and baskets but the material was first soaked in a preparation of pounded bark and water. In Aitutaki, Cook Islands, bark cloth was pressed down in the mud of a *taro* patch for two types of cloth. (See 39, pp. 82, 83.)

Dyes mentioned by early writers but not now in use are as follows:

Pritchard (24, p. 130) as his type material in describing the printing of patterns, states that the design was rubbed over with the reddish-brown juice obtained from the candlenut tree. It may be that he confused the candlenut tree with the reddish-brown juice obtained from the *'o'a*. On the other hand, the Cook Islanders used a candlenut bark mixture (*vavai hiri*) in dyeing their cloth. One cloth termed *pareu* was soaked in the mixture and on drying assumed a reddish-brown color. It is curious, however, that the present Samoans, though asked about it, know nothing of its use in the past.

Stair (33, p. 145) states that, "A beautiful crimson was obtained by mixing the bark of the root of the *nonu fi'afi'a*, Malay apple (*Eugenia Malaccensis*) with sea water and lime."

Stair (33, p. 145) states that yellow was also obtained from the bark of the *nonu*, but *ango* and *lenga* seem to have completely displaced it. In the Cook Islands the root of the *Morinda citrifolia*, under the name of *nono*, was used as one of the sources of a yellow dye, and sea water was formerly used to brighten up the color.

Stair states that a brown was obtained "by mixing the inner bark of the *pani* with sea-water." Pratt (23, p. 233) gives *pani* as the name of a tree but does not give the scientific name. He also gives *pani* as a verb, to dye the hair with the juice of the *pani*.

COLORED DESIGNS ON BARK CLOTH

With the exception of red earth (*'ele*), the dyes described are applied to cloth in a state of solution, and penetrate the pores of the object so treated. This general method, universal throughout Polynesia, comes under the term "dyeing." The methods of dyeing vary. To clearly appreciate one of the Samoan methods, not hitherto described in detail, it is necessary to define the described methods used by the Polynesians. While recognizing that they are all forms of dyeing, it seems permissible to use the term in the more restricted sense that the word conveys to the average reader.

The material is immersed and soaked in the dye solution. In the Cook Islands, the dye was contained in a wooden bowl and the completed cloth soaked in it until it assumed the right shade of color. Many types of cloth were so treated. The color thus showed on both sides of the cloth and permeated through the material. Designs in other colors could be subsequently added by other methods.

Painting. The color designs were painted freehand on one surface of the

completed cloth with some type of implement used as a brush. The color showed on one surface only except in thin cloth where some of the dye soaked through and made irregular markings on the reverse side.

Ruling. Single, double, or multiple parallel lines were drawn across one surface with special implements devised for the purpose. This method was common in Hawaii.

Stamping or printing. Special patterns carved on wooden stamps were stamped or printed on the surface of the completed cloth. In Hawaii, narrow stamps of bamboo were called *ohe kapala*. In the Cook Islands, larger square or rectangular frames made of wood with crossing lines of dry coconut leaflet midribs were called *rakau takiri pahoa*. For both, the dye was dabbed on the stamp or frame and then pressed down on the material. The process was repeated over the surface to complete the design.

It has been erroneously stated that the Samoans used the printing method. The error evidently dates from Wilkes, who was in Samoa in 1839, and who states (42, vol. 2, p. 150):

> The tapa is often printed in colors in patterns. This is performed in a mode similar to that practised in Europe before the introduction of copper rollers. Instead of engraved blocks, they form tablets, about as thick as binder's boards, of pieces of large cocoa-nut leaves, by sewing them together. One side of the tablet is kept smooth and even, and upon this coconut fibres are sewed so as to form the required pattern, which is of course raised upon the surface of the tablet. These tablets are wet with a piece of cloth well soaked in the dye, after which the tapa, which for this purpose is well bleached and beautifully white, is laid upon them and pressed into close contact. The dye is made from herbs and roots, and is of various colors.

Samuel Ella (11, p. 167), after describing the *upeti* frame as a board on which "cords of sennit or hisbiscus bark were fastened across and across," says, "These cords were smeared with dye, by a cane brush or ball of *siapo* and then the native cloth was carefully adjusted upon the board and rubbed by hand or beaten with the *betel* to take the impression."

The statement that the tablet was first moistened with the dye and the cloth afterwards placed upon it was evidently accepted by Brigham (4, p. 110), for in speaking of the Hawaiian printing types, he remarks that they "were a far better, if more laborious, substitute for the Samoan *upete,* and the similar wholesale stamp of the other southern groups." The inference is that the method of applying the dye was the same.

The correct technique had been mentioned by Pritchard but has been overlooked by subsequent writers. Pritchard (24, p. 130) had previously written as follows:

> The printing of the patterns is done by spreading the cloth over a large board, on which are fastened (by a particular process) the ribs of the coconut leaf, and while stretched out it is rubbed over with a reddish-brown juice, obtained from the candlenut tree, which grows in all the islands of the Pacific. This juice marks the cloth only where the ribs of the cocoa-nut leaf raise it.

The statement that the cloth was rubbed and not the ribs of the coconut leaf is correct. Though it may appear a detail it makes a totally different technique and constitutes the vital difference between rubbing and printing.

The Samoan tablet, which is called *upeti* (not *upete*), was not used as an engraving block or a stamp with the printing process. Wilkes commenced wrongly by stating that the tablet was made of large coconut leaves, whereas large pandanus leaves (preferably *paongo*) are used. In rubbing the cloth, the dye soaks through and stains the tablet as if it had been directly applied. Wilkes saw the stained tablets and the cloth stained with similar designs. He, therefore associated them together in what seemed the only obvious technique. I was six weeks in Samoa before I saw the *upeti* actually used. Not having read Pritchard, the same obvious association had been held by me as by Wilkes and Ella. The above is stressed to show that even what seems only too obvious should always be verified. Hence to the methods of dyeing must be added the following process:

Rubbing. Dye is applied to the upper surface of the cloth by rubbing to bring out the design of a tablet placed beneath the cloth.

SAMOAN METHOD OF DYEING CLOTH

The Samoans divide their present methods into two: *tutusi* or *mamanu* (painting) and *elei* (rubbing). The expression *tutusi* is the act of printing or drawing, and *mamanu,* the design obtained by painting. Pratt (23, p. 50) gives *o'ai* (to mark or paint *siapo*) and *o'ainga* (a marking of native cloth). He also gives *o'ainga* as a synonym of *elei,* but it is obvious that he was not clear in either the technique or the exact shade of meaning of the words. Dyeing by immersion was formerly practiced.

Dyeing by Immersion (*fui*). Cloth was formerly dyed red in the *nonu* dye and the process termed *fuinonu.* So, also, the cloth dyed black in *pani* was called *fuipani,* as was also the process. The method of immersing in the black mud of a taro swamp also comes under this heading. Pratt (23, p. 177) gives *lufa* as a large, black *siapo* and *sema* (23, p. 262) as a red one.

Painting (*tutusi*). Cloth painted freehand with a brush is called *siapo tutusi* or *siapo mamanu.* (See Pl. XXXIII, *C,* 1, 2.) The plain white cloth is pasted together to the required thickness and size. When ready for the brush, it is called *tasinga.* The materials required are a board, dyes, dye cups, and brushes.

The board (*papa*) is the same one used in pasting the sheets together.

The dyes, such as *ango* (yellow) and *loa* (red), are usually freshly made. The *'o'a* and *lama* are kept in large, stoppered coconut shells. (See *pupu 'o'a,* Pl. XXXII, *D,* 1.)

Dye cups to contain the dyes for use are formed of large, half coconut shells, that are simply cleaned out and kept after use. (See Pl. XXXII, *D,* 2-5.) The brushes consist of four types:

(1). The keys of the pandanus fruit that have fallen to the ground and become dry form neat natural brushes. The thicker outer part acts as a handle whilst the stiff fibres of the inner, smaller end are trimmed to form the brush. The amount of trimming is regulated by the thickness of the lines desired. They are called *tusi* from their use in drawing the *tutusi* patterns. They are used for drawing the finer lines or the outlines of figures.

(2). Larger *tusi* brushes are made of coconut husk (*pulu*), which is trimmed to suitable sizes. They are similar to the *pulu* brush used in applying breadfruit paste to stick the sheets together. Thicker lines and the spaces in between are filled in with such brushes.

(3). Larger brushes are also made by tying some strips of *fau* bast together (Pl. XXXII, *A*, 2, 3) or breaking the ends of a piece of coconut leaf midrib or cane to split up the fibrous material into a brush-like appearance.·

(4). Cloth wipers (*tata*). A piece of *siapo* is folded and tied at one end to use as a daub or wiper for filling in wide spaces. This type is called *tata*. (See Pl. XXXII, *A*, 1.) Both brushes and wipers are sometimess called *ale*, probably when used to give a second coating of the dye.

The cloth is laid on the board, which gives it an even, hard surface to be stretched on. The painting is done in sections. The artist dips her *tusi* brush into the appropriate dye cup and deftly draws the outlines of the section design. The design is filled in with the various colors, each color having its own cup and brush. Some colors are given a second coating, to show them up. One coat of *'o'a* gives a dull, red-brown color but a second coat gives it a varnished appearance. The second coat is called *'āle*, or *'ale'o'a*. The *lama* mixed with *'o'a* gives a shiny black. A second coat is called *talama*. The ordinary repainting of black cloth is called *amoamo*.

As one section is completed, another part is moved into position on the board. Large sheets of cloth are often spread out on the floor upon the mats. The part done is usually rolled or folded so that the artist may have her work before her as she sits crosss-legged on the ground. The part spread out is weighted down with stones at the edges to prevent it being blown up by any breeze.

Some artists use a shell for scraping lightly over the painted design to trim it off.

The varieties of painted cloth are few as compared with those dyed by rubbing. They are easier to do by painting and there are probably more of them in circulation through trade than of the others. The varieties enumerated in Savaii are: *lau'a tasi*, the single sheet kilts worn by young men were usually painted or smeared over with *'o'a*; *taloa*, the corresponding garment worn by young women of rank, but consists of two thicknesses of cloth; *siapo mamanu*, which class includes any cloth of three or more thicknesses,

which range in size from that suitable for kilts to very large sheets used as curtains. (See Pl. XXXIII, *C*, 1, 2.)

Rubbing. In dyeing cloth by the *elei* method of rubbing the process must commence with the thin *lau'a* sheets. The rubbing and the pasting proceed together until the *siapo* cloth is completed. In addition to the requisite quantity of *lau'a,* the materials required are a board, design tablets, dyes, paste, dye daub, and paste brush.

Board (*papa elei*). The board is the same large slab used in painting. It must be wider than the design tablet and is now called *papa elei* from its function. Being usually formed from the side of an old dugout canoe, it has an outward convexity transverse to its long axis. (See Pl. XXXIV, *B*.)

Design tablets (*upeti*). The original tablets were constructed on a foundation of pandanus leaves. Some of them are still in use but they are being supplanted by the more modern article made of wood.

The tablet of pandanus leaves is called *upeti fala,* though the kind of pandanus preferred is the *paongo,* which has larger leaves than the *fala.*

A typical tablet (Pl. XXXIV, *A*) is made of two layers of leaves. The lower layer consists of 36-inch lengths of 4 leaves and a narrower strip, laid together with overlapping edges stitched together with *fau* bast. The upper layer consists of 15.75 inch lengths laid transversely to the long axis of the lower layer. The design is in 4 distinct sections, each of which is dealt with separately. The design material consists of pandanus strips and two-ply twisted cords of sennit fibre. The pandanus strips, one leaf thick and 3 to 6 mm. wide, are used in the design to form vertical panels separating the sections and are also placed horizontally and obliquely to divide the sections into smaller areas The pandanus strips are laid in position on the leaves of the upper layer of one section and stitched to it with loops which pass through that layer alone. The section is then laid in position on the lower layer and the sennit cord elements of the design are stitched in position, through both layers of the tablet. Each section is treated in turn from the left. The stitches of the pandanus strip therefore keep the leaves of the upper layer together while those of the cords bind both layers together. The pandanus elements in straight or zigzag strips map out the design into smaller areas which are filled in by parallel lines of cord arranged in horizontal or oblique sets. The pandanus strips are stitched to the upper layer with single thick sennit fibres or with fine twists of two fibres which look like fine copper wire. The stitches over the cord elements are of *fau* bast, while here and there, a strip of the same material is passed over the pandanus strip and through both layers of the tablet. The tablet is finished off with a piece of sennit braid stitched around the upper surface close to the edges, forming loops at both long edges and ending at a corner with a coiled length.

Some *upeti* are smaller than the one described and the designs on them vary but all are rectilinear. The tablet, being soft and yielding, is of no use unless it can be fixed firmly to some solid material that will give it support.

Setting up the design tablet. The tablet is laid longitudinally on the long axis of the board on its convex outer surface. The sennit coil at the right lower corner (Pl. XXXIV, *A*) is untied and stretched across the under surface of the board to pass through the loop opposite. The loop is drawn taut on the under surface of the board and the braid brought back to the next loop on the near edge. In this manner, the braid zigzags from loop to

loop alternately from side to side until all the loops are drawn taut, when it is tied to the last loop. By this means, the tablet is drawn down on the board without a crease and firmly fixed in position. (See Pl. XXXIV, *B*.) The design is fixed to the wood as if it had been carved on it.

The pandanus tablet is the invention of a people who did not have the tools or the skill to cut out elaborate designs in wood. They added the design to the leaves in the technique possible to them. After the advent of steel tools, however, the designs were cut on the wood (*papa*) with the superior tools available to form wooden tablets (*upeti papa*). The wood used is usually part of the side of an old dugout so that they are usually convex over the short axis. (See Pl. XXXIV, *C*.) The same rectilinear designs were used in the older forms but with the more modern make on ordinary straight boards, curves have been introduced. Through the comparative ease with which wooden tablets may be made and their longer life, the pandanus tablet is being gradually abandoned in favor of the modern article.

Technique of rubbing. The *upeti* is placed on the ground with its length transverse. Beside it are placed a pile of *lauu'a* sheets, a dye cup with the *'o'a* dye, a *tata* wiper of bark cloth, a lump of red earth, a shell grater, a tuber of cooked arrowroot, and some sharp-edged strips of bamboo.

A single sheet of *lauu'a* is spread over the tablet with its wider butt end towards the worker. The left side is adjusted to leave a clear margin beyond the left edge of the tablet. The near end edge of the sheet is similarly adjusted to the near edge of the tablet. The sheet is not as wide as the transverse length of the tablet so another sheet must be added, but with its narrow end reversed towards the worker. The right edge of the first sheet is rubbed with the cooked arrowroot paste for about an inch deep along the part of the edge that rests on the tablet. The left edge of the second sheet is placed over the pasted part and rubbed smoothly with the *tata* wiper to stick them together. A third sheet is usually necessary to cover the remaining part of the tablet and leave some spare material to the right. It is reversed with the broad end proximal and stuck by pasting the right edge of the second sheet. (See fig. 167, also Pl. XXXIII, *B*.)

The red *'ele* earth is used to brighten up the *'o'a* color. The *mangeo* shell grater is held above the cloth and the lump of red earth rubbed against its rough outer surface. The grater is moved about so as to sprinkle the powder evenly over the surface of the design. The *tata* wiper is rubbed over the surface and the brick-red powder sticks to the wet surface and brightens up the color. When the design is sufficiently clear on the first layer of sheets, another layer is added above it.

The area of the design is rubbed over with the moistened arrowroot, care being taken to restrict the pasted area to the actual area of the design. A sheet of white *lauu'a* is laid on the left side above the first sheet. It is

immaterial whether it is narrower or wider so long as the left edges are made to coincide. Its right edge is then rubbed with the paste over the width of the design and a second sheet placed in position. A third sheet follows, the method of alternately reversing the ends being followed as with the first layer. The three sheets of tse second layer are then rubbed evenly with the *tata* wiper to make them adhere to the first layer. The wiper is dipped in the

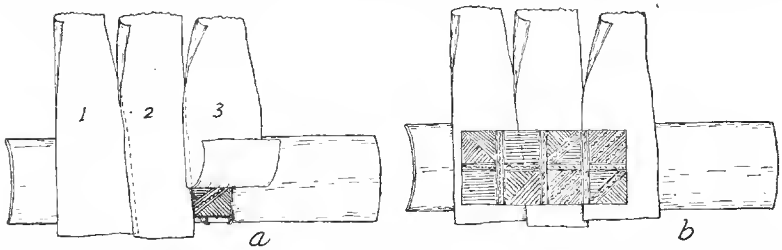


FIGURE 167.—Rubbing bark cloth on tablet: *a*, three sheets placed on the tablet with the near end of the third sheet turned up to show part of the tablet tied to the board below; *b*, the *tata* wiper is dipped in the *'o'a* dye and rubbed over the sheets in even strokes to press them firmly down on the raised design of the tablet. Commencing on the left, each part is rubbed to bring out the portions of the design on the upper surface of the sheets, the colored lines corresponding to the raised parts on the tablet.

'o'a dye and the design brought out on the second layer by rubbing. If thin cloth is desired, the process may stop with the addition of the second layer of sheets. For thicker cloth, a third layer is added in exactly the same way as the other two. The last layer usually gets a more careful rubbing and a more liberal sprinkling of red earth. The rubbing of each layer is, of course, to make the sheets lie down close to conform with the ridges and depressions of the design. The dye which damps the cloth enables this to be done. If each layer were not done, the design would not come out clearly on the surface of the upper layer. The dye also soaks through the cloth and not only shows up the design on the under surface of the first layer but also stains the tablet. As pointed out before, it is this staining which filters through the layers of cloth that gave the idea that the dye had been directly applied to the tablet.

The completed first section is rolled back to the left and after manipulating the right edge of the design on the cloth to coincide with the left edge of the frame, the rolled part is anchored in position by placing stones on it. The extra material beyond the right edge of the dyed part is now on the tablet. The sheets of the middle and upper layers are folded back to the left and kept there with a stone leaving the lower layer alone on the tablet. Remember that the three layers are only stuck together as far as the right edge of the design. The lowest layer sheet is smoothed out evenly on the tablet and its right edge rubbed with arrowroot for the depth of the tablet. Another sheet of *lauu'a* is joined to it and another to the right of that until the

tablet surface is covered. The design is brought out on the first layer by rubbing and then it is covered with paste. The second layer sheet is loosened from under the stone and turned in over the tablet. The second layer is completed, rubbed and pasted. The upper layer sheet is then turned in over the tablet from the left and the third layer completed. After rubbing with *'o'a* and red earth, the second section is complete. In this manner by successive sections added to the right, the desired length is obtained. Some women may start from the right and work to the left. In large sheets, the measure is always the number of *upeti* or tablet lengths.

Depth is obtained by adding successive rows of rubbing to the first row. It is now better to unroll the completed part which has been rolled parallel with the left edge. It is rolled again from the proximal edge. On the left, this brings in the first section rubbed until its far transverse edge coincides with the near edge of the tablet. The free parts of the two upper layers are folded back proximally and the sheets of the lowest layer are spread out on the tablet. The overlap of the individual sheets are pasted together at their side edges for the depth of the design. If there is any gap between individual sheets in the same layer, a fresh piece is cut to size with the bamboo knife and pasted in to fill the gap. So also any trimming of frayed edges is done with the bamboo knife. The first layer being satisfactorily arranged it is rubbed with dye and then pasted. The sheets of the second layer are then turned forward individually and stuck to the first layer. Any holes or gaps are remedied so as to maintain an even thickness in the cloth. The second layer is rubbed and pasted, the third layer is turned forward and carefully rubbed. This completes the first section of the second row. The material is pulled to the left and successive sections added on the right until the full length is secured. The only difference to the first row is that the near edge is stuck together as well as the left. Care must therefore be exercised in getting paste down into the left-hand corner of each new section so as to stick the sheets evenly together. Successive rows are added until the depth is secured. In arranging the lower layer of each new section, the edges must be carefully adjusted to make the design continuous without any breaks between the tablet areas.

The technique of increasing length and depth is the same as in preparing plain cloth for painting, but the layers are adjusted to the smaller area of the tablet and each layer is rubbed with the dye before paste is added. The above detail should dispel the error that the dye tablets were used as printing frames with the dye directly applied to the design and thence stamped on the cloth.

The *tata* wiper served as both paint brush and brush for smoothing out the sheets laid on the paste. Samuel Ella (11, p. 168), after adhering to the fallacy that the *upeti* was rubbed directly with the dye, states that the cloth was pressed and beaten down with the hands and with a *betel* (beater). On

the numerous occasions when I watched the tablet being used, the firm rubbing strokes with the wiper were quite sufficient to bring the design out distinctly. The use of the beater was never mentioned. The small *i'e tusi tusi* as already mentioned may, however, have had such a use.

The upper surface of the completed cloth is in one color. The lines are less sharply defined at the edges than in painting, and a certain amount of smudging may be seen in the lighter areas between the colored lines. The design may be enhanced by painting over some of the wider lines when they show up with the brighter varnished color that a second coat of *'o'a* gives. Parts may also be gone over in black, which gives a brighter varnished appearance because the black *lama* is mixed with *'o'a* as a vehicle for the color. Apart from the close, red-brown background that rubbing with *'o'a* gives, rubbed *siapo* (*elei*) can always be recognized by the same, though lighter, design appearing through on the under surface. (See Pl. XXXIII, *C,* 3, 4.)

VARIETIES OF RUBBED CLOTH

Cloth prepared by the rubbing process receives names according to the size and the uses to which it is put: *siapo,* though a general name, also denotes the shorter-sized pieces suitable for use as a kilt—the reward given to a talking chief for calling the *kava,* is referred to as one or more *siapo; potu,* a sheet larger than a *siapo,* often used as a small screen. Pratt (23, p. 224) gives it as the screen from behind which a spirit spoke; *pupuni,* a large sheet used as a screen to shut off an end of a house; *ta'i namu,* a sheet used to make mosquito curtains; *ululima,* a large sheet measuring fifty lengths of the *upeti* tablet; *uluselau,* a very large sheet measuring 100 lengths of the *upeti.*

USES OF BARK CLOTH

Loin cloth (*malo*). Samuel Ella (11, p. 167) states that the *maro* (malo) made of *siapo* was a narrow strip of a foot wide and six feet or so in length. The *maro* of other Polynesian islands was wound around the waist and an end passed back between the legs. Stair (33, p. 110) states that the *maro* (girdle), tied loosely around the loins, was worn by thieves in their night operations.

Kilt or skirt (*lavalava*). The single sheet (*lau'a tasi*) worn by men and the two thicknesses (*taloa*) worn by women, when used around the waist as kilt or skirt are called *lavalava* from their use.

Belt or girdle (*fusi siapo*). Pieces of varying length and about a foot wide were worn around the waist as girdles after the fine mats had been put on. The girdles were often for keeping the mats in position. Cloth rolled around the waist was also called *fanga'au* or *fangau.*

Wrappers (*'afu*). A sheet of cloth was used as a wrapper in the evenings or early mornings.

Bed clothes (*'afu loto*). Sheets were used as bed covers at night after discarding the kilt. It was usually the same as the *'afu* mentioned above.

Poncho (*tiputa*). According to Samuel Ella (11, p. 168) and other early missionaries, the *tiputa* was introduced to Samoa from Tahiti by the missionary teachers. It was about five feet long by thirty inches wide, with a hole in the middle. The head was put through the hole and the sleeveless garment thus covered the breasts and back, which the Samoans in their own culture saw no necessity for covering.

Bodice without sleeves (*pi*). This was also a missionary introduction contemporaneous with the teaching of foreign ideas of modesty.

SMOKED CLOTH

Plain cloth was occasionally colored by subjecting it to the action of smoke, whereupon it became smoked cloth (*siapo fa'aasu*). Such cloth was worn only by the village maids or chiefs' sons.

A smoke house (*fale fa'aasu*) was formed of a number of light poles arranged to enclose a fireplace at their lower ends. The upper ends were tied together at a point.

The cloth after being pasted together was rubbed by hand with coconut cream (*pe'epe'e*). A fire was lighted in the enclosure and after it had burnt down to glowing coals, the cloth was wrapped around the frame to form a tent-like structure. Outside of that, old, used mats were wrapped around to prevent the escape of the smoke about to be generated.

Material, to give off smoke, was placed on the coals by raising the side of the tent. The materials used were:

(1). The root or underground stem of ti split into longitudinal lengths.

(2). The outer covering the green sugar cane stalks (*pa'u tolo*).

(3). The *ngatae* wood (*Erythrina indica*).

The *Cordyline* and sugar cane smoke produce a yellowish brown; *ngatae* gives a much deeper brown. The soaking with coconut cream enables the smoke to penetrate the texture and thus give a lasting color. The cloth is moved from time to time in order that the whole surface may be evenly smoked.

SANDALS

The soles of the feet of the Samoans became so thickened from childhood that no protection is needed for ordinary locomotion. On occasion, however, sandals (*se'e vae*) are used to protect the soles from particularly sharp coral while wading inside the reef. The method of attaching by cords passed between the toes causes considerable chafing to the more tender skin between the toes and on the dorsum of the foot, especially when coral sand gets under the cords. For this reason, sandals were not much in favor. I have seen

men and women walking about among sharp coral with apparently no inconvenicnce.

Sandals are thus said to be used principally to protect the soles when

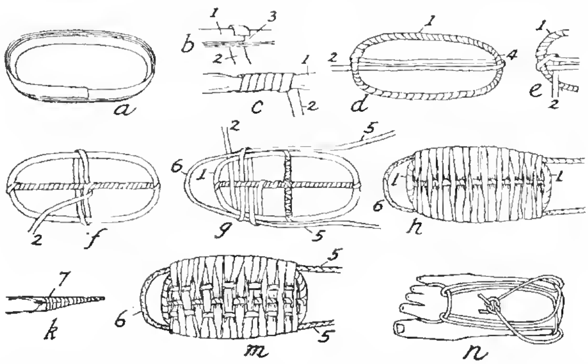


FIGURE 168.—Sandal (*se'e vae*), technique in *fau* bast: *a,* a strip of bast an inch wide, is wound loosely around the hand for about five turns to form the outer boundary element of the sandal. The size of the loop suits the size of the foot, the length being from the heel to the root of the toes. *b,* A second strip (2) is wrapped transverse around the folded first strip, commencing where the first strip ended (3); *c,* the strip is continued on with overlapping seizing to bind the folds of the first strip together and thicken the whole border loop; *d,* having completed the round of seizing, the second strip, is carried down the middle line of the now laterally compressed loop (1) around its far end (4) and back to the starting point; *e,* the working strip (2) is brought around the near end of the oval (1) and then around the double middle strip; *f,* the working strip is bound around both middle strips for their full length and then brought back to the middle, where it makes a transverse turn around each side border of the oval; *g,* the two side radials are then wrapped closely in turn and a long three-ply braid of *fau* bast (5) is laid against the two sides of the oval in such a way as to form a loop at one end (6). The working strip (2) is run spirally to midway of one of the long radials and passed from side to side around the rim and the braid, interlacing at the same time with the long radial. *h,* The working strip is then manipulated so as to fill in the oval binding element with transverse turns. The strip passes around the rim and braid at each side and alternately above and below the middle longitudinal radials. Fresh strips are added by wrapping the commencing end around the finishing end of the old strip at the rim as in (*b, c*). *k,* As the transverse turns get closer together, the pointed stick is used to open a way between the previous turns. The end of the working strip is also folded together to form a point and bound with a thin strip of fibre (7). This stiffens and narrows the end so that it may be pushed through the holes made by the stick. Additional transverse turns are made with the aid of the stick between those already made and the working strip carried back to the other end. Some sandals end at this stage. *m,* Short turns may be taken around the transverse turns by working down the longitudinal on either side of the middle. When no more can be made, the sandal is completed. The loop (6) is drawn out to a suitable size as the cords (5) may be pulled in either direction. *n,* The sandal is worn by placing the loop end forward and bringing up the loop cord between the big and second toes and the fourth and fifth respectively. This differs from the Cook Islands and New Zealand method where the loop is towards the heel. The two free cords at the other end of the sandal are crossed behind the heel, brought forward through the toe loop and returned on the same sides to pass around the cords near their points of emergence from the sandal. They then pass forwards to be tied over the dorsum of the foot.

they have cracked, as often happens with the thick, hard skin. It was further stated that since free medical attention is now readily available throughout both groups, sandals are seldom made. The examples for this description had to be specially made, as there were none in use.

Three kinds are made; from *fau, lau'a'a,* and *pulu* respectively.

Sandals of *fau* bast (*se'e vae fau*) are made with a particular technique, but the other two are makeshift articles. The material required is a quantity of *fau* bast strips about an inch wide and a stick a little thicker than a lead pencil sharpened at one end. (See fig. 168.) The sandals are always made short, coming to just beyond the ball of the foot, with the toes projecting unsupported in front. (See Pl. XXXV, *A*, 2, 3.)

A temporary form of sandal (*se'e vae lau'a'a*) is made from a couple of sheets of the fabric-like material at the base of coconut leaves (*lau'a'a*). (See Pl. XXXV, *A*, 4.) The material is soft and affords protection to a cracked sole. They do not last long but are easily made (fig. 169).

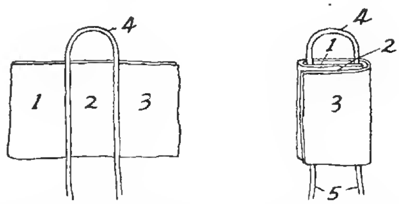


FIGURE 169.—Sandal of coconut *lau'a'a*: *a*, the sheets are folded into a rectangle 10 inches wide by 5 inches long and a long strip of *fau* bast (4) is looped and laid over the middle third (2) of the material. *b*, The left third (1) is folded over the strip and then the right third (3). The foot is placed upon the folded material and the toe loop (4) and heel cords (5) attached as with the *fau* sandal.

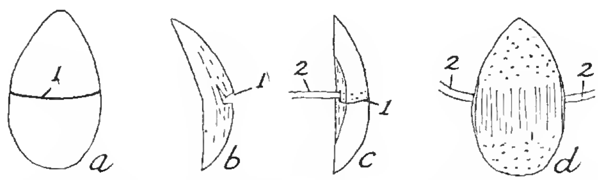


FIGURE 170.—Sandal of coconut husk (*pulu*) :*a*, the outer skin of the section is cut transversely across the middle line for a depth of not quite 0.25 inches. The sides of the segment are trimmed so that the thickness here is a little over a quarter of an inch. The cut therefore at the side edges does not come quite to the upper surface. *b*, The anterior half of the segment is now bent towards the inner surface and levered forward so as to split forward slightly along the bottom (1) of the cut. The direction of the split is at right angles to that of the cut. *c*, Still holding the anterior half bent to open up both the cut and the split, a strip of *fau* bast (2) is passed down into the cut and worked forward into the split. The first half is then straightened back, the edges of the cut come into perfect apposition and the *fau* strip is held in the split. The strip has thus been buried and so protected from being worn out if simply tied around the outside of the husk. *d*, The foot is placed on the upper surface of the sandal and the two ends (2) of the strip may be drawn tight over the dorsum and tied.

Another temporary form (*se'e vae pulu*) is made of coconut husk *pulu* (Pl. XXXV, *A*, 1). A longitudinal slice of husk, about 7 inches long by 4 inches wide, is cut off level to fit the foot. The section is naturally oval with thin edges and deepening to a little over an inch in the middle. The method of attaching the *fau* bast tying strip is shown in figure 170.

SIGNIFICANCE OF CLOTHING, CUSTOMS, AND USAGES

The articles grouped under clothing were made by braiding, looping, plaiting, and beating out bast. In none of the technical processes was twining or weaving, either downward or upward, used. The primary use of clothing is protection from the weather and concealment of the person. The secondary use, which may become more important, is decorative. On distinguishing individuals decoration leads on to distinguishing social classes. From use as indicating rank and status, they became valuable property and certain articles have intertwined with social customs, finally becoming a medium of exchange and an economic standard of value in themselves.

Clothing. The primary need for clothing dwindled down in the tropical climate of Samoa to one causative factor, concealment. Modesty, however, demanded little. The exposure of the upper body in both sexes was not considered immodest, or rather, was not considered at all. Hence the *titi* kilt of *Cordyline* leaves fulfilled all the actual requirements of clothing. A few titled women and sons of chiefs used bark cloth *lavalava* as a change garment. All other articles, therefore, listed under clothing were created by other needs.

Decoration. Festivals with accompanying dances demanded something beyond the ordinary ti leaf kilt. The demand was easily met by using the brighter colored ti leaves and change was also secured by making kilts of bast, first by simple looping to waist cords and later by plaiting.

Rank and property. The desire to further decorate and distinguish the daughters and sons of high chiefs, as in the persons of the village taupou and manaia, gave a stimulus to textile development that the need for ordinary apparel would never have supplied owing to that need being of so little importance. The short *'ie tutu pupu'u* with wide wefts but highly decorative effect was the natural outcome. The present form of these kilts with their many free tails may be later chronologically, but coarse plaiting in bast certainly preceded the finer forms with their more elaborate tag attachments.

With decoration heading in the direction of finer plaiting, the *'ie fau* and *'ie sina* garments were evolved and became a still more material expression of rank. They were not needed and could not be worn as everyday clothing. They were purely an expression of rank to be worn during ceremonial and discarded as soon as possible afterwards for the sake of comfort. Fine plaiting also proceeded with pandanus material and reached its culmination in the

fine mat decorated with red feathers. Here again the fine mat marked rank and was only worn on ceremonial occasions. A person wearing a fine mat on ordinary occasions would be regarded in much the same way as a person of a higher culture appearing at breakfast in a dinner suit with his breast emblazoned with orders and decorations. The rank and status of people was well known within the village but on state occasions and especially when visitors from other villages were present, it was fitting that rank should be decorated in accordance with its station. The *'ie fau, 'ie sina,* and fine mat discharged that duty.

As these mats distinguished rank, they became valuable property. Rank besides its social significance was distinguished by the possession of material property or, in other words, wealth. The wealth of a family was demonstrated by the numbers of *ta'ui* bundles of fine mats stored on the cross beams of the guest house.

Customs. The *'ie sina* and fine mat became the necessary equipment of the village maid. Through association with the village maid, the *'ie sina* also became the garment on which her virginity was officially proved before marriage. The *'ie sina* thus became a highly specialized garment necessary to the particular custom of testing the virginity of the taupou.

The fine mat, however, gained a wider sphere of influence. It supplied the dowry of the village maid and chieftainesses of rank. The husband's family supplied the food, including pigs for the wedding feast, which, with other presents such as weapons, noraments, canoes, or houses, were grouped together under the name of *oloa.* The bride's family supplied an equivalent value in fine mats distinguished by the term *tonga.* Hence the derivation of the name of the fine mat, *'ie tonga,* and we get the fine mat constituting *tonga* (valuable property).

From association with marriage, the fine mat became associated with birth. It formed such an absolute necessity at marriage that after the birth of a daughter, mothers commenced plaiting a special fine mat termed an *'ie fa'atupu* to form the nucleus of her daughter's dowry. These were carefully plaited in spare moments between the completion of other fine mats and were often finished just before the marriage of the grownup daughter took place. Some of them thus took over sixteen years to complete. Appropriate presents on the birth of a chief's daughter were fine mats to mark the occasion.

At death, fine mats again figured importantly. The ceremonial connected with the death of a high chief was termed *langi.* The blood relations of the deceased contributed fine mats for the *langi.* Amongst them had to be one of special note, either from the extra fineness of the plait or from its historical associations. The mat was called *'ie e fai a'i tonga* (the mat which gives distinction to the property), or *'ie e fai a'i le langi* (the mat which gives distinc-

tion to the funeral ceremony). Without it, the subsequent distribution of fine mats lost distinction and the family consequently suffered in prestige. When the family did not own such a mat, they begged or borrowed one from without and thus placed themselves under heavy obligation. The special mat, however, never passed outside the village but usually went to the highest ranking talking chief of the village, who acted for the family of the deceased during the funeral ceremonies. The talking chiefs of the various visiting parties, which were called *auala* on account of their *ala* or blood relationship with the deceased, recited the *langi* ritual as they sat before the house of death with palm leaves laid on the ground before them. If their *ala* was proved or well known they were allowed to proceed. If they acquitted themselves with scrupulous correctness they received fine mats at the distribution in accordance with their status. Apart from the special fine mat of note, the *tama sa* or son of the sister of the deceased had the first pick of fine mats.

Thus in birth, death, and marriage customs, fine mats played the most important part from both an economic and ceremonial point of view. The Samoans attached the greatest value to them and neglected no chance of acquiring them. They themselves admit that a talking chief will enter into negotiations for the marriage of his chief influenced solely by the bundles of fine mats he has seen hanging up in the guest house of a girl's father. He knows that in the subsequent distribution of the marriage dowry among the husband's family, he, by virtue of his official position, will get the most important share. Similarly, at funerals a high chief will often refrain from attending because his talking chief has to recite the *langi* and will thus get the fine mat that is given to his party. Talking chiefs on the other hand will never neglect attending a funeral if he can prove an *ala* pathway to the genealogical tree of the deceased chief.

An unscrupulous yet humorous talking chief attended a funeral near Apia when he had no true *ala* but hoped to bluff his way through to a fine mat. Seated with his palm leaf before him, he began to recite the *langi*. The astute talking chief of the family of the deceased interrupted calling, "Never mind the *langi*, tell us the *ala* by which you find yourself here." Having no genealogical pathway, the impostor kept on reciting the *langi*. When he had recited five out of the customary ten *langi*, the interruption became so marked that he realized his scheme had failed. Now, the term *ala*, besides being a genealogical pathway between blood kinsmen, is also the ordinary material pathway between villages and houses. Before vacating an untenable position he replied to the aggressive defender of the family fine mats. "The *ala* by which I came here?" he cried pointing at the road, "There it is, the *ala* which leads from Apia to this village." "Kill him," yelled the infuriated official to the family henchmen. The visitor sprang to his feet. "Quick," he cried as a parting shot, "Show me the *ala* to the missionary's house." At the missionary's house, he found refuge until the storm subsided. Then without a mat, he returned along the empty *ala* to Apia.

The above incident shows that while the desire to acquire fine mats was great, the desire to keep them was equally strong.

It may be truly said that in their present elaborate form, marriage and death customs could not be correctly observed without fine mats.

Standard of value. Through their value as property, the fine mat became the Samoan standard of value. We have seen that in the building of a house, a fine mat ratified the agreement between the prospective owner and the head builder. It paid a fine and pacified the builder's guild into overlooking a serious breach of etiquette. It formed the principal medium in paying for the building of a house at the *umu sa* ceremony. Canoes, tatooing, and various services were paid for in fine mats. High chiefs rewarded their talking chiefs with fine mats. No important function or activity in olden times could take place without the passing of fine mats. In Samoa, fine mats became the equivalent of the coin of higher cultures and the shell money of the western Pacific. Everything was valued in terms of fine mats and all objects of any value, even pigs, had their relative value based on the value unit of the fine mat.

FAMOUS MATS

Fine mats with a history assumed a sentimental value out of all proportion to their intrinsic value. Songs have been composed giving the history and changes of name of some of them. The historical value exceeded that of the fineness of plait, though where both existed the value was naturally enhanced. Some of them, worn by age, have been patched again and again and the number of patches adds to the value. A mat seen at Savaii belonging to the talking chief Timu of Safotu, had a very fine plait, was brown with age, and had many patches. It had been the property of Malietoa Laupepa and was named Lauao-o-Tuiatua. The Ripley family of Leone have one named Faauma-i-tuavao. It is 6 feet square, brown with age, and beautifully fine with 22 wefts to the inch. It is a source of expense in keeping repaired as very few can now do the fine repairing required. A particularly expert old woman when called in must have a pig killed for her. She has to be fed well during the long period she takes in leisurely repairing the mat and has to have a substantial present as well. A master builder of Savaii once hatched a plot to obtain possession of it. He ingratiated himself with the unsuspecting Fepuleai Ripley and after working up a friendship suggested building a house for his father. The father at last consented. The beautiful long house that stands at Leone, and which is the best in eastern Samoa, was duly built with expert care as to detail. When it came to payment, however, the master builder repudiated all the fine mats and cash liberally offered and demanded the one fine mat known as Faauma-i-tuavao. He tried to insinuate that it formed part of the price by mutual understanding. The friendship and months of labor had all been part of a scheme to obtain possession of the famous mat. A less strong character than Mr. Ripley, Senior, would have succumbed to ceremonial

pressure but he refused in no uncertain manner and the mat remained with the family.

Interaction of custom and technique. Though tradition holds that the fine mats are very old, any fine technique must not only have time but a strong incentive to develop it. It is natural to expect that there has been an evolution in the technique of the fine mat. The gradual improvement in technique led to an increase in the material value of the mat. With increased material value it became *tonga* (valuable property). As such it became the material medium for expressing certain customs. This gave it a still greater value which must have reacted on technique by stimulating the women to greater effort. The finer the plaiting, the greater the value. The greater the value, the greater the incentive to fine plaiting. Women became famous for their fine plaiting and the fine and arduous work rendered the mat worthy of the high recognition it ultimately received.

Plaiting houses. The ordinary floor mats for furnishing a new house were made by the *aualuma* (assembly of unmarried women) who might meet together in a house set apart for plaiting. The real plaiting house (*fale lalanga*) was, however, occupied by an assembly of expert women, mostly married, who met to plait fine mats on the invitation of a high chief who kept them in food and made appropriate presents. Apart from such a working bee, women were constantly at work plaiting fine mats to supply their own family needs.

Bark cloth. Bark cloth had little value in old Samoa as everyday clothing material. Its other uses in the house have been mentioned. It formed, however, a useful if less valuable medium of reward and exchange. Talking chiefs were rewarded with *siapo* at the chief's *sua* meal and in ceremonial kava drinking when he called the cups. A high chief desirous of adding to his prestige would perhaps pay with fine mats but for many occasions, *siapo* was correct. At lesser weddings, bark cloth enters into the presents. In more recent times as fine mats are becoming scarcer, bark cloth is taking their place in ceremonial. Talking chiefs and others attend ceremonial gatherings wearing *siapo*. Bark cloth now figures largely in presents to visitors. In western Samoa, the Administration stopped the giving of fine mats as a policy measure for the good of the people, and bark cloth took their place at weddings and funerals. Greater quantities are given, however, to maintain the standard of value. For trade, and to fulfil social obligations, bark cloth making is still a live craft with every prospect of surviving for years to come. Samoan cloth never reached the stage of excellence that it did in other islands, such as Hawaii. This may be partly due to so much of women's best work and skill being directed towards plaiting the vastly more important fine mats supplemented by the shaggy mats of *'ie fau* and *'ie sina,* and partly to the difference of technique in manufacture.

STONEWORK

On first passing through a Samoan village, the impression is formed that the Samoans went in for a good deal of stonework. This is especially true where the villages are situated on rocky ground. On coming to details, however, it is seen that the impression is largely due to stones being extensively used as house platforms. On rocky sites, nature has provided the abundant supply of stones, but the Samoans for their own convenience have been forced to arrange them in some sort of order about their houses. Pig walls and paved roads also add to the false impression that the Samoans were stone workers of considerable ability. The quantity of stone that influences the observer is unworked stone. When it comes to worked stone, as exemplified by stone adzes, the Samoans lag far behind their fellow Polynesians to the east, in stone technique.

UNWORKED STONE

House platforms. The use of unworked stone in house platforms has already been described (p. 66) together with the loosely paved terraces common in sites where stone was plentiful. The extra terraces, built by a chief in honor of successive wives, must also be remembered. Some of these are built a little out from the completed terraces of the house platform and have no structural connection with it. This lack of continuity was puzzling to me until the reason was explained. A heap of stones, a cairn, or a terrace may thus be used to celebrate some event that has been forgotten or lost with the dead historians. The tendency to ignore the psychological and seek a material use may lead to an explanation far from the real cause.

Stone seats. The stone seats made of a large slab with another set upright or slanting at its back, characteristic of some of the house platforms in the Marquesas and the Cook Islands, were not used on the Samoan house platforms. The open character of the side walls of the houses gave plenty of fresh air and rendered it unnecessary to seek in the evenings the house platforms. From within the house, all that was going on outside could be seen.

Pigeon netting platforms (*tia seu lupe*). The cleared platforms associated with the chiefly sport of netting wild pigeons were located in the forest usually on some commanding ridge. The ground was levelled off to provide concealment shelters for the fowlers. To obtain the required space, the sides and lower end were built up and faced with stone. One, named Muli-maunga, situated on a ridge at the back of Leone, was 14 paces square, the sides and end towards the lower slope being built up with stone. The end towards the upper slope of the ridge was formed by the ground level. The *tia* vary, some being raised completely above the ground on all sides. The stones were the available stones scattered about, and built up loosely merely to face the earth

which had been leveled off and thrown to the sides. Some *tia* are famous in local history.

Monumental cairns (*tia*). Cairns of unworked stone were raised over the graves of the dead. Some of these erected over children and people of lesser importance are merely rectangular patches of larger stones loosely laid on the ground near the houses. Where the loose stone pavement has been continued out from the house platforms, the memorial arrangement can hardly be distinguished at times from the other stones. These are quite common throughout the villages, the Samoans evidently preferring to bury their dead near their houses rather than in detached cemeteries, though a few such are now seen.

For higher chiefs, the cairn is built up in loose rectangular piles that may be stepped as in Plate XXXV, *B*. These again are quite common throughout the villages. Some cairns were fairly large and high but always of loose stones arranged to maintain the rectangular form.

Commemorative heaps. The people often visited some hilltop or other on a walking trip or malanga. To mark the occasion, stones were carried up or collected in the vicinity and piled in a heap. Some of these heaps may be seen in places where the stones did not occur in nature but were obviously carried by human agency. Mr. Judd remarked this on the large hill in Tutuila called Olomoana. The Chief Faumuina of Aunuu Island said that the hill was often visited by his *ali'i* predecessors for the sake of the view. The guard (*soatau*) took stones up on each occasion and piled them in a heap. They served not only as a memento of the visits but could be used as sling stones and throwing stones if they were suddenly attacked while there. Where people of a different culture commemorate a visit by carving their names on rocks and cliffs or defacing historic objects, the Polynesian made a cairn of stones.

WALLS

Walls of loosely built rock or stone may be divided into two kinds; for defensive purposes and for restricting the wanderings of pigs.

Defensive walls (*'olo* or *pa taua*). Many of the villages in olden days had stone walls built around them to assist in keeping out attacking war parties. For such purposes, the wall was called a *pa taua* or *'olo,* though *'olo* usually refers to the village or place thus fortified. Such a wall in ancient days was built around Leone on the landward side, but the sea side was left open.

The village on Aunuu Island was extensively defended during the war between Faumuina and Maunga of Pago Pago. The wall was about 6 feet high and ran along the sea front. The right flank ended in a loosely built stone tower protected by the main village and a large body of men. The left flank also ended in a stone tower. The right tower, now nothing but a heap of stones, was said to have been originally 20 feet high. The tower, termed *pu'e*

consisted merely of a raised platform of loose stones. On these sentries were posted in war time. Behind the flanks, the coast was rough and prevented the landing of canoes, hence the back of the village needed no artificial defense. Traces of the wall are still to be seen about 50 to 60 feet back from high water mark, but most of the stone material had been removed to build a pig wall. Between the wall and the water's edge, a number of wooden sharp points were set closely together and firmly imbedded in the sand. This prevented direct frontal rushes by people landing from canoes.

Pig wall (*pa pua'a*). Pig walls are usually built at the back of the village or a little distance away to enclose a space termed *sauauli* in which pigs may roam. Judd writes (17, p. 16):

> The village pig pen is a community institution, and from all appearances an ancient and honourable one. The walls are substantial and look almost like fort walls. The acreage enclosed is considerable. Pig pastures is a better term than pig pen. Because of the steep hill back of Ofu, the inland boundary of that village pig pasture is cut into the bank. Pigs are fed coconut meat refuse from which *pe'epe'e* has been extracted.

The walls are built of loose stone and range from 4 feet to 4 feet, 6 inches in height and about 2 feet, 6 inches to 3 feet in thickness. Steps are sometimes made on the outside with stone, or styles of coconut tree trunks cut to make steps are formed by leaning the trunks obliquely against the top of the wall from either side.

STONE ROADS

Though the paving of the old tracks and roads have received much attention from various foreign administrations, largely as an occupation for law breakers, many of the roads had been roughly paved before the advent of white influence. Some of the roads in Savaii and Upolu are said to have been made under Tongan rule; others have a mythical origin such as the road between Puapua and Le Alatele in Savaii. In a competition between two *itu* (supernatural beings) the one from the Faasaleleanga district commenced at the Puapua end and owing to rough work and less care he moved more quickly. He got well past the midway mark before he met his rival who had been doing better work as regards quality. The result was that the bad worker opened up more territory for his descendants for the boundary was formed where they met and where the difference in the quality of the road can still be observed. Hence the saying applied to the Faasaleleanga people: "Faasaleleanga, mata e vave" (Faasaleleanga, the quick eyed).

The moral is to do things quickly, no matter how roughly, in order that you may win.

A very fine, high-built road extends between the two ends of the Fitiutan village and forms an important boundary between the inland and outer parts. Though built up and improved in modern times, its foundation was laid in olden days.

The stones are naturally selected to form a flat surface but there is no attempt at cutting them to fit, though, of course, the natural stones are fitted as far as possible along the sides.

STONE HOUSE

The so-called stone house (*fale-ma'a*) known as Le Fale-o-le-Fee (the House of the Octopus) is situated some miles inland of Apia, Upolu, up the Vaisingango stream. Various Samoan myths refer to it, and many writers have mentioned it. It has come to be regarded by some as a relic of bygone megalithic culture which predated the existing Samoan culture.

Stair (34, p. 241) visited the site in 1845. He stated that the house had originally been 48 feet in length by 45 in breadth. He held that it had been built in the usual round or elliptical shape but that slabs of basalt had been substituted for the wooden posts usually placed to support the eaves. He found twelve or thirteen of the stone posts still standing. They were about 4 feet out of the ground. He described a center slab of stone that supported the roof as having fallen to the ground. In the next paragraph he says that the center slabs appear to have been originally 12 or 13 feet in length, 15 or 18 inches in width, and 7 or 8 inches thick. The ends had been inserted in the ground and he imagined that "when placed upright, another slab had been laid horizontally upon them, from which other slabs or posts were raised to support the roof. Several of our party had seen these center slabs standing not long before and could thus testify to their appearance. It was said that lately some young fellows, hunting wild pigs, had passed the spot, and amused themselves by pelting the slabs and throwing them down. . . . One portion of the floor of the house had been covered with a pavement of neatly placed slabs of stone; but these had begun to be displaced." Stair goes on to state that the material was obtained from the side of a basaltic precipice close at hand. He offers the theory that the slabs were split off by the natives kindling a fire on the solid bed rock in the direction in which they wished the fracture to run and then dashing cold water over the heated surface. Their "work, as far as the rending of the rock is concerned, is accomplished." He then accounts for the moving of the blocks by means of rollers or small skids.

Pritchard (24, pp. 119-121) who wrote in 1866 gave the dimensions of the house as 40 feet by 50 feet. There were 18 standing pillars forming the ellipse. They were 3 feet high, 9 inches thick one way, and 6 inches the other. "Each pillar has a notch or shoulder on the inner side for supporting the roof." Other side pillars were lying on the ground "in such positions as to show that the whole of the side pillars were once in their places in the building." One center pillar, 5 feet high, 12 inches thick one way and 9 inches the other, was standing. A second center pillar lay on the ground and measured 7 feet in length, exclusive of the broken pieces still lying in the same line

"which would increase the length to 13 feet. A block of stone, 6 feet long and 6 inches square lay on the ground near the center evidently intended to rest on top of the center pillars and there to form the upper angle of the roof. . . . The rafters lie scattered about, some inside amongst the ruins, others at the base of the hill whence they were cut, showing the house was never completed. They are in lengths of 12 and 6 feet, and are 4 inches square. Allowing for the outward curve given by Samoan builders to the rafters of houses after this model, and for the relative heights of the center and side posts, two of the 12 feet and one of the 6 feet lengths would be required to span the arch from the wall plate to the ridge pole, that is, to form one complete rafter."

I visited Le Fale-o-le-Fee on February 18, 1928. After a little trouble, the guide located the site on a triangular flat formed by a side stream called Le Vai-o-le-Fee on the east, the main Vaisingango stream on the west, and a steep hill side across the base on the south. The site was covered with underscrub. One large tree grew on the site; another encroached on the southwesterly circumference. A large rotted trunk had also fallen over the site. The dimensions could be readily distinguished by the stone flooring which had a clearly defined circumference. The ground plan as measured with a chain tape was 50 feet by 45 feet.

Side pillars. A number of side pillars stood around the circumference. They were not counted as it became evident that some of them had been recently propped up. Not one of them had been sunk into the ground firmly in the manner one would associate with permanent fixtures. They had been placed standing on end and other pieces of rock laid against them on the ground to keep them upright. Some were leaning over in a slanting position and one was leant against another to prop it up. The dimensions of those measured are given below.

Height	Sides in inches	Height	Sides in inches
2 ft. 2 in.	7x4x11	2 ft. 11 in.	
2 ft. 9 in.		3 ft. 4 in.	6x5x6x5
3 ft. 2 in.	7x5x6x7	3 ft. 2 in.	7x5
		4 ft. 5 in.	8x10x9x7

The pillars consisted of basaltic prisms and columns which followed a natural cleavage. Most were four sided but some were three sided where the wider surface was curved. Only an occasional one was rectangular. In the others, the angles between the surfaces formed two acute angles and two obtuse angles. The height of the side pillars ranged from 2 feet, 2 inches to 3 feet, 4 inches. None of them was worked by man. Though some had broken off at an angle at the upper end there was absolutely no sign of the

notches or shoulders described by Pritchard (24, p. 119). The pillars standing were about 5 feet apart.

Center pillars. The place was so overgrown and interfered with in parts by the roots and stem of a growing tree that it was impossible in the time available to clear the ground sufficiently to make a thorough examination of the floor of the site. The largest piece of stone found near the center, was 4 feet 5 inches in length and was lying on the ground. This was evidently Stair's center pillar 15 or 18 inches wide and 7 or 8 inches thick which he estimated to have been originally 12 or 13 feet in length. It would also correspond to Pritchard's center pillar standing 5 feet high, 12 inches thick one way and 9 inches the other. The second pillar 7 feet in length with broken pieces reaching to 13 feet had evidently been overgrown.

Rafters. Nowhere could anything be seen of the 12 feet and 6 feet lengths which formed Pritchard's rafters, though numerous short pieces lay scattered about.

The quarry. A perpendicular basaltic cliff formed part of the hill at the back of the house. The exposed base of the cliff was a few yards up the hill. Some detached pillars stood out at a slight angle from the cliff face, others had fallen to its base and were scattered in short lengths over the sloping ground below. Other pieces were lying on the ground between the base of the hill and the house site. The material had fallen from the base of the cliff by natural causes and had been transported to the house site. The floor of the house in addition to being covered with short lengths of basalt had been filled in with waterworn stones from neighboring streams.

ANALYSIS OF DATA

Both Stair and Pritchard inferred that the framework of a typical Samoan round or elliptical house had been built of stone. As the outer circumference is marked by upright stones, they held that these were the wall posts of the house. The house thus occupied the full area of 45 feet by 50 feet. This is larger than the usual *fale tele* house. We have seen that the fair sized round house in Fitiuta was 31 feet 7 inches long by 27 feet 6 inches. The exceptionally large house in Iva was 54 feet by 45 feet. In the house at Fitiuta the center pillar was 20 feet high and in the house at Iva, 32 feet. Both Stair and Pritchard calculated the height of their center stone pillars as being 13 feet. Such short central pillars could not serve a house of the large dimensions indicated by the wall pillars. Pritchard (24, p. 119) stated that the wall pillars each had a notch or shoulder on the inner side to support the roof. Samoan wall posts are notched on the outer side for supporting the wall plate. Pritchard calculated the length of stone rafters as being 30 feet, in three pieces, two 12 feet lengths and one 6 foot length. Such lengths were not seen by me but admitting that they were present in Pritchard's time, how

were they joined? If not joined, how were they supported in the span between ridge pole and wall plate? Pritchard speaks of allowing for the curve made by Samoan carpenters in their rafters. How could such a curve be made with three pieces of rigid material? From a purely technical point of view, the Samoan carpenters, even if directed by the god Le Fee, could not possibly construct the roof framework with the stone material available. Details of lashings and supports have to be disposed of before an actual construction in stone can be considered seriously. The idea of a stone house evidently existed in thought and imagination. A certain amount of material was mobilized but the actual stone structure complete in all its parts never materialized. It could not on the ground plan indicated. The thirty-foot stone rafters stood in the way of practical accomplishment.

When Stair visited the site in 1845, twelve or thirteen of the side posts were still standing. When Pritchard visited it years later, eighteen were standing. Five or six posts had been erected by visitors. When I saw them they all gave one the impression of being temporary erections. I had to stop my two companions from erecting a few more. In Stair's time, the center pillars were down but one had been raised on Pritchard's visit and again fallen by 1928. Stair (34, p. 242) stated that some of his companions had seen them standing. It has thus been the habit of even early Samoan visitors to play with the stones and erect or knock them down as the fancy seized them. The present situation of individual stones has therefore not been a fixed one.

In assessing the value of Le Fale o le Fee as a relic of a bygone megalithic culture, certain facts stand out:

(1) The stone was never cut by human agency as Pritchard (24, p. 120) inferred. They were not even split off the cliff face by fire and water as Stair (34, p. 242) believed. Such basaltic prisms occur naturally in other parts of the Pacific in basaltic formations. It is unnecessary to imagine an early people building fires at the base of the cliff and carrying water up from the stream to split off prisms to experiment in building a house that they had no technique for completing.

(2) A stone house was never completed on the site marked by the stones. As I visualize the circumstances, the site between the fork of the streams with the basaltic cliff at the back intrigued the imagination in early times. The Polynesian is more readily influenced by freaks of nature or by the uncommon than most people imagine. The basaltic columns were talked about by fowlers and others who had seen them. The site became a camping ground and a place of interest that was visited. People played with the fallen blocks and let the imagination evolve around the idea of using the pillars as house material. A *paepae* (circular house platform) was built from smaller blocks and waterworn stone from the streams. Pillars were carried and set up

loosely round the circumference where wall posts should go. Larger pillars were set up in the center in the position of the *pou tu* of a wooden house. The priests and the people may have got the idea of building a god house to Le Fee. Something of this nature occurred as indicated by tradition and by the quantity of stone transported from the base of the cliff. An actual house of wood may have been built on the platform. With the building of the house platform and the erection of side and central pillars, stone construction ceased. The use of stone to provide leaning posts was quite sufficient to give the structure the name of *fale ma'a* (stone house). Tradition and myth have been built round it to explain formations near at hand said to be coral brought from the reef by Le Fee but Stair (34, p. 243) showed them to be calcareous spar.

THE SEAT OF SINA

About 9 feet from the house site in line with the cliff, an arrangement of basaltic stone was called Sina's seat by my guide. Both Stair and Pritchard mention it without the name which is probably a more recent embellishment. Though said to be a seat, it appears more like a monumental *tia* raised over a grave. (See Plate XXXV, *C*.)

RUINS IN VAIVASA VALLEY

Prehistoric remains discovered in the mountains of Upolu in the neighborhood of the head waters of Vaivasa were stated to have been seen by Handley Bathurst Sterndale in an article written by his son, R. A. Sterndale (36). A great fosse excavated, built up, and further heightened by a parapet wall, a truncated conical structure "of such huge dimensions as must have required the labor of a great multitude to construct," cairns, a vault, and a triangular cromlech with a conch shell resting on it, form the imposing list of things seen. The truncated cone was formed of stones laid in courses some of which weighed a ton at least and must have been rolled or moved on skids to their places according to the explorer. In spite of the efforts of the Samoan Society to locate the spot, no one has seen the wonderful remains. The article was written 38 years ago. In the wars that took place between the Tongans and the Samoans and between the Samoans themselves, it was natural for defeated parties to take refuge in the mountain fastnesses. Such occupied sites were not places where people elected to live but where they were forced to by circumstances. The arrangement of stones to form house sites and to build burial cairns are to be expected. The traveller writing popular articles is liable to give his imagination full play and is not in the frame of mind to distinguish between the stones artificially arranged by man and the huge masses moved by nature. Identification takes place and man is credited with doing the impossible by some secret of engineering skill now supposed to be

lost. The "great multitude" required could not live cut off from breadfruit bearing trees, land adaptable to cultivation, and the food resources of the sea. A megalithic culture that preceded the Samoan cannot be seriously entertained unless supported by further data that can be checked. Cairns and arrangements of stone in caves have been reported but when closely investigated will probably be found to be well within the compass of Samoan culture.

PROPITIATORY ROCKS

A number of natural, large rocks are connected with myth and tradition. Some are connected with historical events and though pointed out, have no special significance beyond illustrating how the imagination is given full play in associating natural physical features with historical characters. Thus the number of stone seats, kava bowls, and other impossible stone artifacts associated with the name of Sina and found throughout the various islands serve to cement the historical association of various ancestors with certain districts and visitors are always taken to see them. They form part of the sights of the districts. By this means also various myths common to Polynesia are localized by various branches of the Polynesians in their own islands.

TUPUA ROCKS

The true *tupua* rock is the petrified body of an ancestor. Such are the two rocks, Ui and Luamaa, near the ancient village of Saua in Tau. They represent the petrified bodies of the parents of Tangaloa-ui who were turned to stone as they reached the shore after their long swim from the Atu Atafu. Such also is the stone representing the body of Faatausili. In Faatausili the petrifying process was gradual, commencing with his feet. He was thus enabled to give advice regarding Apaula's request for assistance which the state of his nether extremities prevented him from carrying out in person. Petrifaction always resulted in the normal shape of rocks and did not retain the human form of the subject so commemorated.

Some rocks seem to have been placed in particular positions by human agency and an ancestral name with supernatural qualities given to them. Such a one stands in the village of Safotu and in ancient times was treated with respect and superstitious awe.

Other natural rocks are also called *tupua* and are associated with prohibition. A *tupua* rock on the beach near Amanava in west Tutuila must not be passed by without leaving an offering of green leaves or flowers, else it will rain or some misfortune will happen to the party.

WORKED STONE

Inquiries about quarries elicited no results except in Tutuila, where we were taken to a stone quarry called Tatanga-matau on the spur of a range at the back of Leone. On the upward climb, a pigeon fowling terrace (*tia*) was passed. Before reaching the actual quarry, the hillside was found covered with chipped stones and large flakes. In spite of the large quantity of flakes, very few discarded adzes were found. In many places there were heaps of finer chips showing where trimming had occurred. Further up the hill, on either side of the main ridge, large pits had been excavated. On the northerly side were a large, deep circular pit and a smaller four-sided one. On the southerly side, a deep, wide trench ran for a short distance in the line of the ridge and then turning at right angles ran out on the hill slope. In all the pits, the earth had worked down the sides and there was no clean-cut face of rock visible. The rock could, however, be made out on clearing away the earth and it was visible here and there in the side of the deep trench. The overgrowth and tumbled earth was too great to clear away in the time available.

On the middle of the ridge between the pits, there was a large accumulation of fine chips, much finer than those on the lower slope of the hill. The accumulation was in two distinct areas of several feet in extent and some depth.

Breaking the stone (*foa*). The stone or rock obtained from the quarry was broken (*foa*) by striking it with another rock. The pieces were then selected for chipping into shape. It would seem that the Samoan accepted the pieces that the rock broke into and over the shape of which he did not have much control. The adzes were shaped to suit the sizes of the pieces and the variations in thickness in the same general type of adz may have been largely influenced by the nature of the pieces into which the stone broke. Though a piece might be thinner than usual, it was a pity to waste a good piece of stone and a thin adz resulted.

Chipping (*tanga*). The verb *ta* means to strike, usually with something. The pieces of stone were struck with a hammer stone to remove chips and so shape the stone into a *matau*.

Grinding (*olonga*). The grinding of the chipped *matau* had to be undertaken where water was available. The term *olo* means to grind and *olonga* the grinding. It is only after the *matau* which was shaped by chipping, has had the cutting edge ground that it receives the name of *to'i*, the general term for a completed adz. I say, "after the cutting edge," advisedly, because the large number of adzes in the Bishop Museum collection showing various stages of grinding show that the bevel surface which finished off the cutting edge is the last part to be ground. Places where adzes were ground are

situated by streams or the seashore. The place where the track from the Tatanga-matau quarry strikes the stream in the valley below is called Olonga-toi (grinding of adzes) for it was here that many of the *matau* from the chipping workshop above were ground. Large stones with a wide surface, standing in the stream, were used as grindstones. The chipped adzes were dipped every now and again in the stream and rubbed (*olo*) back and forth on the surface of the basaltic grindstones. In course of time circular hollows were formed which served the purpose better as water could be poured into the concavity and the adz and grinding surface kept wet. Some stones contain more than one grinding facet. Evidently, a deep concavity was not so good for grinding for some of the flattish stones have been turned over and grinding facets produced on them. Too sharp a concavity evidently interferes with the length of the rubbing stroke. Hence when a facet wore too deep, another was started. It would seem from the fine nature of the chips that the adz makers had shaped many of their adzes on the ground before taking them elsewhere for grinding. Judging from the quantity of chips an immense number of adzes must have been made on the spot, no doubt extending over a considerable period of time. The quarry was well known to the older men who stated that people came from all parts of Tutuila to obtain stone adzes at Tatanga-matau. The term used to denote an adz that has been shaped by chipping but not ground is *matau*, whilst *ta* is to chip. The name of the quarry is, therefore, the "chipping of stone adzes." Among the fine chippings only one poor discarded adz was found. Diligent search discovered only two round stones that could have been used as hammer stones.

Working the stone. The attempt to obtain details as to how the stone was worked proved hopeless. Whether or not fire was used to split the stone was unknown. As stated, there was no distinct face of rock apparent in the quarry. In the larger circular pit, it seemed as if the stone had been in detached lumps that were dug out.

Samoan stone adzes show that two distinct processes were used in shaping the stone; chipping, and grinding. Before the stone was chipped, it had to be broken into suitably sized pieces. On a very large stone in the stream near Nua, Tutuila, there are 13 circular grinding depressions. It is not conceivable that 13 men were all engaged in grinding at the same time, but rather, that a fresh place was used as the others became unsuitable. On a large stone taken from the monumental *tia* of the Tuitele family at Leone, there are four grinding facets on one surface, and three on the other. At Ngataivai in Savaii, a very large stone with many grinding facets was seen protruding up out of the stream. At Olongo-toi, there were originally many of these grindstones but the lighter ones were carried down to the village of Leone to serve as kava mortars. Others are used near the modern water taps as stone washbasins. The name *olonga* refers to the grinding process

and the grindstone itself is called *foanga*. A historical grinding stone near Fitiuta (about 37 inches long and 17.5 inches at its widest part) is called Le Foanga-o-Lae. All these grindstones consist of waterworn boulders of basalt.

Another type of grindstone is provided by the flat lava formation seen in some parts on the seashore. At Leone, near Ripley's house, a large number of these circular depressions on the flat lava of the shore stretch along the water side for many yards and though small holes break the even surface, the smooth parts worn by the constant grinding have quite a polished appearance. Near Vailoa, similar depressions on the shore were noted. Here the sea supplies the necessary water. The large number near Ripley's house shows that many of the adzes were finished off at home, because a suitable grinding material was available. The shore must have been a regular workshop for finishing off the adzes. This again is borne out by the large quantity of stone adzes in various stages that were picked up on the gravelled terrace of Ripley's long house. The grinding of adzes as an indication that industry was recognized as a desirable qualification is shown by the historical remark of Tangaloa to Pava when he saw Le Foanga sharpening his adz, "E lē o Tangaloa po'o Pava 'ae 'o Le Foanga" (Not Tangaloa or Pava but Le Foanga).

The above were the processes observable in Samoan adzes. Grinding as we shall see was limited to parts of the adz and rarely were all surfaces ground. The constant parts ground were the anterior and the bevel surfaces, and the parts of the lateral surfaces to trim off any sharp edges left by the chipping. In spite of the number of grindstones, the impression left by a study of large numbers of Samoan adzes is that the craftsmen did as little grinding as they could.

Besides *foanga* grinding stones, the Samoans referred to *ma'a fa'amata to'i* (stones for putting an edge on adzes). Whether this was merely a functional name for the *foanga* or another type of sharpener could not be ascertained. It is improbable that hones were used. Ground stones from Savaii were reported on by Dr. Gregory as being of fine basalt which have weathered since they were shaped. They were probably rubbing stones for smoothing off surfaces.

ADZES

Native names. The name *to'i* holds for all types of adzes but qualifying names were given to the different types. The general terms *to'i laitiiti* and *to'i tele* were used for small and large adzes. A large adz used for commencing the work is a *to'i lau*. Here *lau* probably refers to a wide surface and hence a wide cutting edge. The term *to'i fau tonu* is used in the second stage of cutting finer chips or shaping and *to'i sila* is the adz used for finishing off. It has presumably a sharper edge. An adz halfted sideways like an

American steel axe and used for felling a tree was said to be a *mele'i.* It was also said to be used hafted end on like a chisel and used as a battering ram in felling a tree. An adz said to be bevelled on both sides was termed *ololua* (two grindings). Pratt (23, p. 323) gives a *to'i ololua* as an adz ground on both sides but as some few adzes have the posterior surface ground as well as the anterior, the name *ololua* may possibly refer to an adz ground on both surfaces and not necessarily bevelled on both surfaces. Adzes bevelled on both sides are not present in the fairly large Bishop Museum collection. Again, though the description above of the *mele'i* adz may be correct as regards use, the name *mele'i* sounds suspiciously like *meleki* the modern term coined to represent the word American.

The *sele ta* was described as a war adz with a cutting edge about 8 inches wide, hafted like a chisel and used in fighting with a forward thrust. It was also used to cut off human heads. Another name for a war adz is *leu tasi.* The term *to'i vete* was given to Mr. Judd as a splitting tool. The term *to'u* is another name for adz.

An adz worn down so much by repeated sharpening on the grindstone that it is too short for use is a *to'i fatu.* A man who did not want to lend his adz to a neighbor importuning a loan would put him off by saying that his adz was no good as it had become a *to'i fatu.* These *to'i fatu* have naturally found their way into collections and should always be considered when classifying adzes into types and sub-types.

In Samoan ceremonial language, the terms used for adzes naturally differ from the universally used *to'i.* The terms *ulaone, fa'alafanua, anga'ese,* and *'ausulu* are the names used by or to chiefs. It is probable that they indicated different types. Other terms were applied to adzes to indicate the type of lashing.

TERMINOLOGY

The terms used follow as far as possible a compromise arrived at by Mr. K. P. Emory, Mr. H. D. Skinner, Mr. J. F. G. Stokes, and Dr. P. H. Buck, on the advice of the Director of Bernice P. Bishop Museum.

An adz is a cutting implement of stone, shell, or other resistant material with the cutting edge running transversely to the long axis of the haft. It is described as if in the following position: the long axis vertical, the cutting edge inferior, and the bevel which forms the cutting edge, posterior.

The adz is regionally divided into two parts; the butt and the blade. The butt is the upper portion which is engaged by the lashings when hafted. The blade is the lower remaining portion. In Samoan adzes the exact line of division between butt and blade is indistinguishable unless the adz is hafted. Individual craftsmen vary as to the length of the adz included in the lashing. (See fig. 171.)

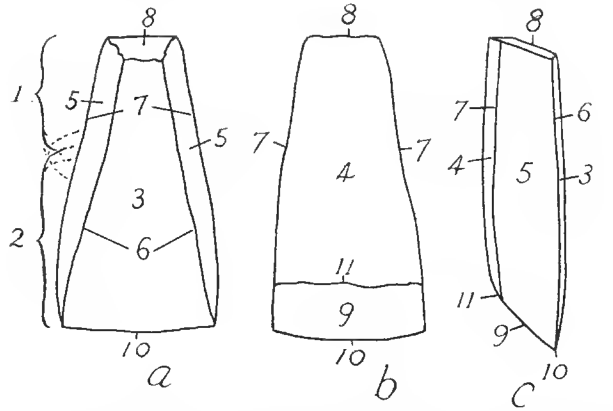


FIGURE 171.—Terminology of quadrangular adzes: 1, butt; 2, blade; 3, front; 4, back; 5, sides; 6, front edges; 7, back edges; 8, poll; 9, bevel; 10, edge; 11, chin (bevel shoulder): *a*, front view; showing front, sides and poll; *b*, back view, showing back and bevel; *c*, right side view, showing side and parts of front and back.

The most common type of Samoan adz has four main surfaces; an anterior (3), a posterior (4) and two lateral (5). The terms *front, back* and *sides* are used to indicate them. The surfaces are separated by longitudinal edges formed by the meeting of the planes of the surfaces. There are two *front edges* (6) and two *back edges* (7). The edges though distinct are irregular where the depressions due to chipping have not been removed by grinding. The *poll* (8) is the upper end of the butt and may form a surface, an edge or a point. The *bevel* is the inclined surface ground posteriorly to meet the front at an acute angle to form the cutting edge, referred to as the *edge*. Other edges are specified. The term *chin* is used to denote the edge formed by the bevel with the back and replaces the term *bevel shoulder* to enable the term *shoulder* to be used exclusively with tanged adzes. The chin is irregular where the back is not ground and it varies according to whether the back is level, convex or has a median ridge.

In triangular adzes with three main surfaces, the two sides meet to form a median ridge which may be in front or at the back. (See fig. 172.) Median ridge is adopted in preference to longitudinal edge, previously used (39, p. 221).

The width of an adz or a surface is the transverse measurement. The thickness is the antero-posterior measurement. "Chipping" is the process of removal by blows of flakes, large or small. (The practice of American ethnologists is to reserve the term "flaking" for removal of pieces of stone by pressure, a process believed not to have been used in Polynesia.)

The adzes available for study in Bishop Museum number as follows: Tutuila and Manua, 119; Savaii, 33; Upolu, 10. These have been grouped into 8 types. The Museum number is given with each adz figured, and measurements are given in millimetres.

QUADRANGULAR ADZES

Type I. Adzes (Pl. XXXVI, *A*). The adzes grouped under Type I, form the most numerous in the collection. The type is quadrangular and narrows

markedly from edge to poll. The front is not so wide as the back and narrows more progressively towards the poll so that the angles formed with the sides become more obtuse as the poll is approached. The surface is well ground but may be rough towards the poll. The sides are fairly evenly chipped and usually not ground which results in the front edges being irregular. They are, however, ground towards the lower end to define the ends of the cutting edge, while sharp edges left by chipping may be removed by grinding. The back is evenly chipped but irregular knobs and deep depressions occur. The bevel is quadrilateral but the chin defining its upper border may be irregular owning to the unground nature of the back, or it may be ground off. No distinctive line occurs between blade and butt though the butt part is usually less carefully chipped. The poll may be trimmed to form a surface which slopes upwards and backwards.

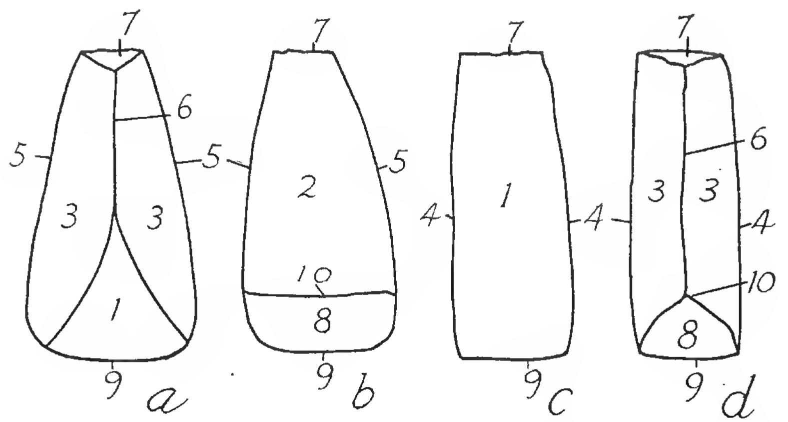


FIGURE 172.—Terminology of triangular adzes: 1, front; 2, back; 3, sides; 4, front edges; 5, back edges; 6, median ridge; 7, poll; 8, bevel; 9, edge (cutting); 10, chin. Triangular adz with front median ridge: *a*, front; showing median ridge (6), small triangular front surface (1), two sides (3), and back edges (5); *b*, back, showing wide back (2), quadrangular bevel (8), transverse chin (10), and back edges (5). Triangular adz with back median ridge: *c*, front; wide front surface (1) and front edges (4); *d*, back; median ridge (6), two sides (3), triangular bevel (8), chin reduced to a point (10), and front edges (4).

The front is convex longitudinally and usually slightly so transversely. The actual front surface, owing to coarse chipping at the sides of the butt, may be narrowed to a point, thus making the surface triangular in shape. The chipping of the back is fairly level but it is convex longitudinally and slightly so transversely. The edge is straight but may be slightly raised at the ends. In most adzes the edge is the widest part of the adz, but in a few it is slightly narrowed by grinding the lower end of the sides. (See fig. 173.)

Variations. Thick adzes. An adz from Savaii, much thicker proportionately than the type adz described, is figured in Plate XXXVI, *A*, 2, and in figure 174.

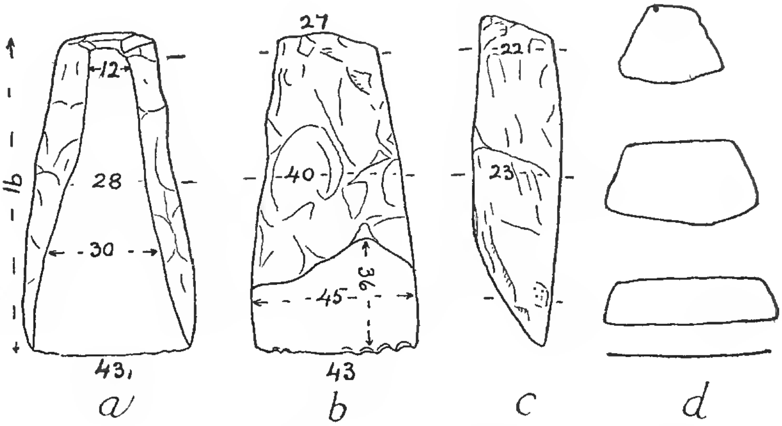


FIGURE 173.—Adz, Type I (B. 8937): *a*, front well ground, narrowing 43 mm. at the cutting edge to 12 mm. at the poll; sides, chipped, showing greater slope in butt portion; poll surface, chipped, sloping upwards and backwards; *b*, back, chipped, no grinding, wider than front and less narrowing towards the poll; bevel, well ground with irregular chin; *c*, sides, regularly chipped, deeper in middle owing to longitudinal convexity of front and back, shows chin; *d*, cross sections, showing greater slope of sides near the poll and straight edge below.

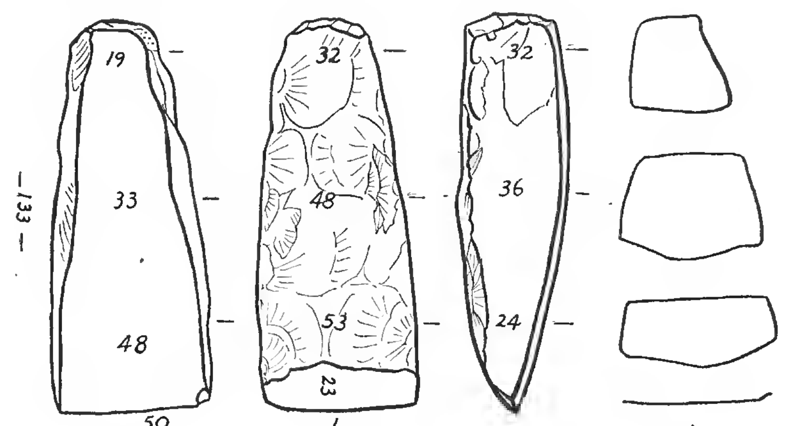


FIGURE 174.—Adz, Type I, thick variety (c. 820): *a*, front, well ground, parts of sides showing; *b*, back, well chipped; bevel well ground, narrow; *c*, side; thickness marked; longitudinal convexity marked in front, less at back; front lateral convexity causes part of front surface to be seen on the side; sides ground towards lower end; *d*, cross sections show thickness of butt and blade in upper part.

Long, narrow adzes, showing greater length in proportion to width, are illustrated by a well-made adz from Upolu. Less narrowing of the front towards the poll is naturally accompanied by less outward slope of the sides in that part. Though 7 mm. longer than the preceding thick variety, it is 11 mm. less in thickness in the middle. (See fig. 175.)

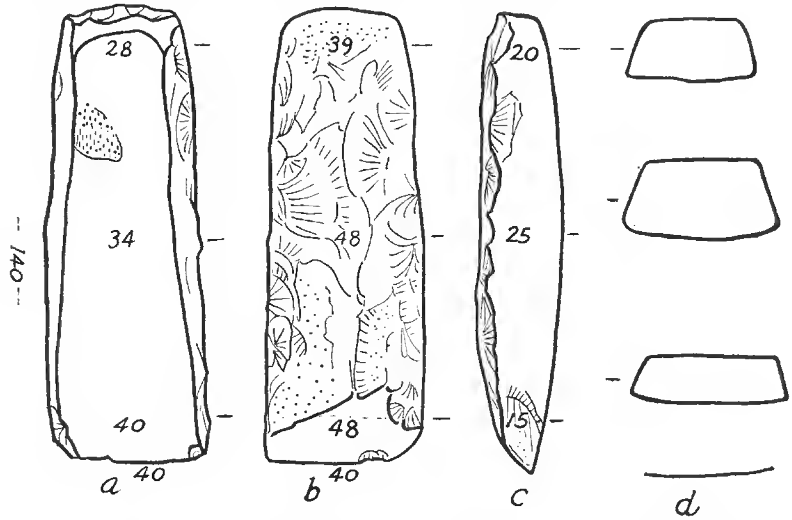


FIGURE 175.—Adz, Type I, long narrow variety (c. 784): *a*, front, well ground, not so narrowed on butt; sides less sloped out; *b*, back, well chipped, except for knob near bevel making chin irregular and rounded off by grinding passing on to back, right corner rounded off reducing width of cutting edge; *c*, side view shows longitudinal convexity of front and back, part of back surface seen; *d*, cross sections emphasize nearer approach of front width to that of back, steeper sides and comparative thinness compared to the thick variety.

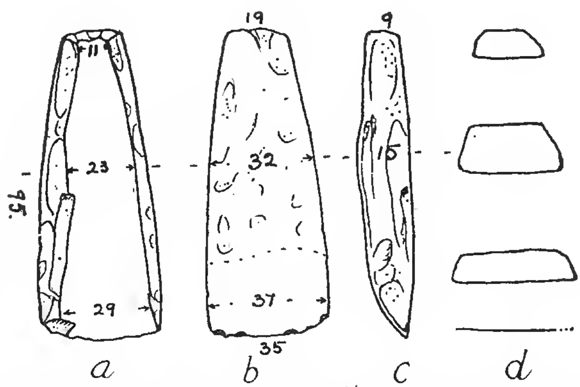


FIGURE 176.—Adz, Type I, long narrow (L. 1475): *a*, front, irregular chipping on left side has resulted in irregular front edge; *b*, back, evenly chipped and some of ridges ground, bevel rounded off leaving no distinct chin; *c*, side, sharp edge between flake hollows well ground down; *d*, sections show greater slope on right side.

A small adz from Tutuila illustrates a long narrow, thin variety. (See fig. 176.)

Wide, thin adzes, comparatively short, are illustrated by an adz from Tau. (See fig. 177.)

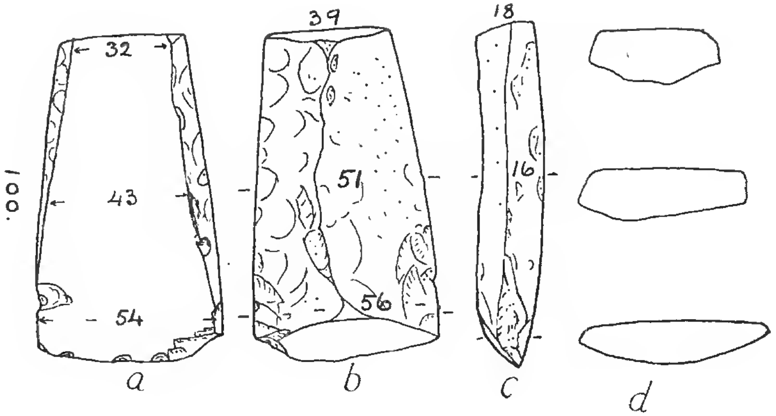


FIGURE 177.—Adz, Type I, short, wide, thin (L. 1471): *a*, front, well ground, very little of sides showing; *b*, back, chipped in from sides leaving irregular median ridge; making chin curve, neighboring part of median ridge ground off on back surface; *c*, side, partly ground lateral surface on right, part of back surface shown on left sloping back to median ridge; *d*, cross section shows width with comparative thinness.

Another wide, thin adz from Savaii shows the range of distribution. (See fig. 178.)

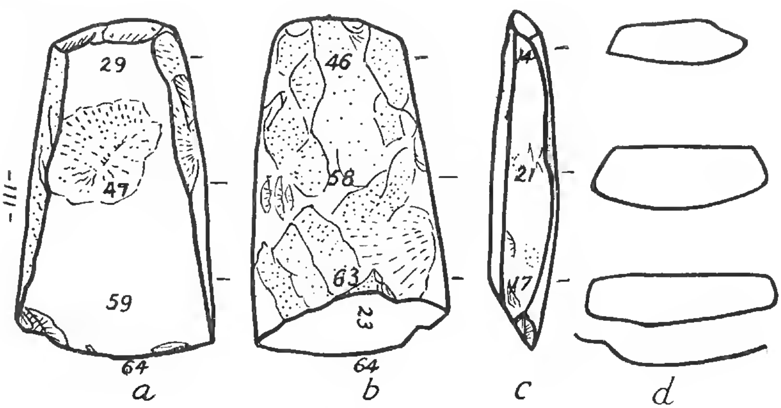


FIGURE 178.—Adz, Type I, short, wide, thin (c. 809); *a*, front, surface well ground but a deep flake depression not entirely removed; part of sides seen; poll surface, chipped; *b*, back roughly chipped with marked transverse convexity resulting in curved chin, right lower corner broken; *c*, sides well ground, part of back seen; upward backward chipping of poll evident; *d*, cross sections showing thinness.

Type II. Adzes (Pl. XXXVI, *B*). Roughly-made adzes of Type II look like unfinished forms of Type I but, from well-finished examples, the employment of a different technique to create a distinct type is obvious.

On the front, the anterior surface resembles Type I in being narrower than the back, well ground, and narrowing towards the poll. Owing to the coarser chipping of the sides, the front edges are more irregular and in poorly made adzes this feature is marked at the butt end.

The sides are formed by coarser chipping with more of an outward slant so that the edge between the front and side surfaces forms a more obtuse angle than in Type I. The side surfaces are narrower and in a side view they may occupy less space than the backward projection of the posterior surface. The back edges are well defined but irregular owing to the coarse chipping of the adjoining surfaces.

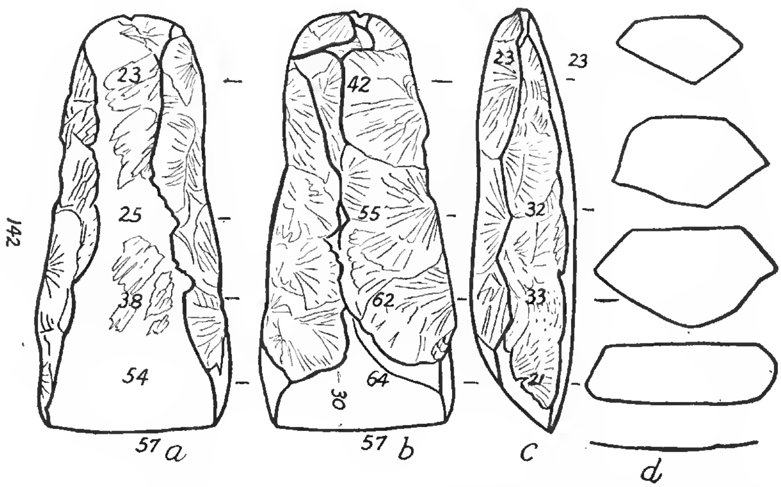


FIGURE 179.—Adz, Type II, subtype a, with posterior median ridge (c. 788) : *a*, front, well ground narrowing towards poll, shallow chipping depressions not entirely removed; front edges distinct but irregular; greater outward slope of sides shows up more of coarsely chipped sides; *b*, back; coarse chipping from sides, distinct median ridge; triangular bevel with base angles cut off by grinding lower end of sides, bevel grinding on right passes back on to posterior surface, chin distinct; *c*, side; coarsely chipped surface bounded on right by front edge and on left by irregular back edge which divides it from back surface; front longitudinal convexity well marked; d, sections: three upper sections show up posterior median ridge giving sections a pentagonal appearance, also shows greater outward slope of sides; section through bevel shows convex curve of sides due to grinding lower ends towards cutting edge.

The back of the adz, instead of forming a fairly level surface, projects considerably in the middle line. In chipping the back inward from the sides, a marked longitudinal median ridge may be formed, or the ridge may be rounded off, yet leaving the back with a pronounced transverse convexity.

The bevel is well ground while the chin varies with the form of the back surface.

Though much variation occurs, the method of treating the back by leaving a median ridge or rounding it off justifies the adzes of Type II being divided into two subtypes.

Type II, subtype *a*. The chipping of the back results in a median longitudinal edge which divides the back surface into two, giving the appearance in cross section of five surfaces instead of four. The median ridge may be irregular, diverge to either side, but is yet distinct. The bevel is triangular though the two sides formed by the shoulder may not be quite straight owing to the depressions and edges encountered by the ground plane of the bevel when it meets the chipped surface at the back. A well-made adz from Savaii illustrates the subtype. (See fig. 179.)

A chipped unfinished adz from Tau also shows a well-marked posterior median ridge. (See fig. 180.)

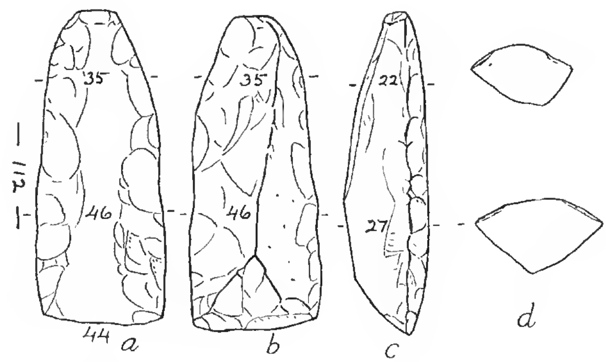


FIGURE 180.—Adz, Type II, subtype a with posterior median ridge (L. 2029): *a*, front; surface not ground, irregular owing to coarse chipping of sides, measurements of width taken between widest parts (back edges): *b*, back; median ridge distinct but diverging to side on butt; bevel, chipped and retouched at cutting edge, triangular shape, ready for grinding; poll, chipped from front and back resulting in curved edge; *c*, side; surface, narrow; back edges, distinct; back surface projects well back to median ridge; *d*, sections; upper section shows posterior ridge to right of middle line; lower section shows marked outward slope of sides and distinct median ridge.

Type II, subtype *b*. The chipping of the back, instead of forming two inclined planes which meet at a sharp ridge, forms one rounded surface with a marked lateral convexity which results in a curved chin. An adz from Tau illustrates the rounded back. (See fig. 181.)

A well-finished adz, also from Tau, shows less backward projection. (See fig. 182.)

Adzes occur which combine features of Types I and II, with regard to their sides; one side may have the more abrupt slope and greater thickness of

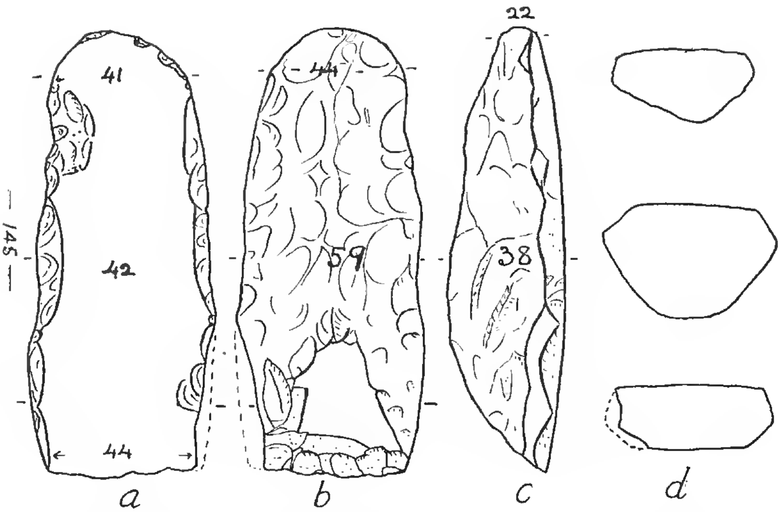


FIGURE 181.—Adz, Type II, subtype b, rounded back (L. 1468): *a*, front; well ground, bounded by irregular front edges due to uneven chipping of sides; *b*, back; surface fairly evenly chipped; bevel grinding not finished but when complete would show curved chin; *c*, side; surface, rough, well ground towards lower end but badly chipped on opposite side; back surface, back projection well marked; *d*, sections; upper near poll, irregular; middle section, shows narrow side surfaces with well rounded convex curve of back; section through bevel shows marked grinding on right but left side has been chipped off.

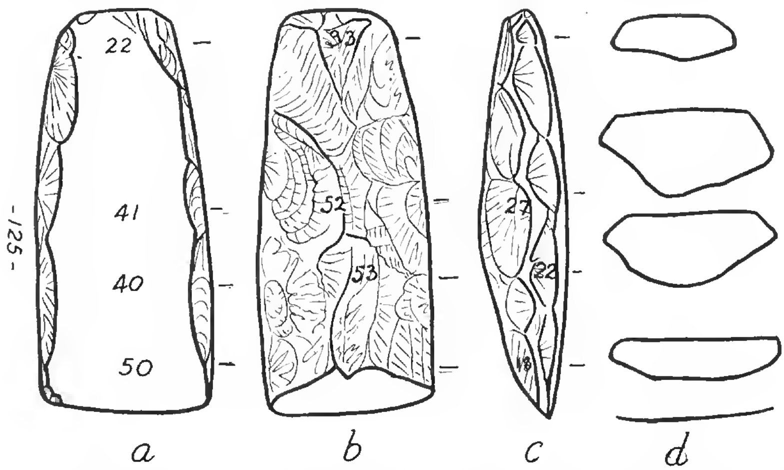


FIGURE 182.—Adz, Type II, subtype b, round back (L. 1469): *a*, front well ground; front edges distinct but irregular; *b*, back, well chipped but deep depressions in parts; bevel bounded by curved chin slightly marred by deep hollow near middle; poll surface slopes forward and upwards; *c*, side, coarsely chipped; back edge ground to remove sharp edges between flake depressions, resulting in narrow zigzag ground strip; *d*, sections show irregular depth of two sides, also rounded back with less projection than in preceding adz.

Type I, while the other may have the more outward slope and shallower depth of Type II.

Progressive grinding. The outstanding feature of the two types described is the reduction of grinding to the minimum required in providing a cutting edge. In adzes the cutting edge is transverse and is formed by an approximately straight anterior surface and a posterior bevel surface. The great majority of Samoan adzes range under Types I and II in the working of which the craftsmen adhered to the principle of minimum grinding. In grinding the front of the adz, practically the whole surface came in contact with the grindstone and shared in the removal of the chipped hollows. In grinding the bevel at an angle with the front, the plane of the back surface was never in contact with the grindstone and hence remained in the chipped condition, except for small trimmings at times near the chin. To define the all-important cutting edge exactly the neighboring parts of the sides were trimmed up by grinding. Except for the lower part and some grinding down of sharp chipped edges, the sides also remained in the chipped condition.

The slight grinding of the sides, however, introduced a slight departure from the principle of minimum grinding, which may progress to the extent of grinding the sides over the full extent of the lateral surfaces as in the Manuan adz belonging to Type I. (See fig. 183.)

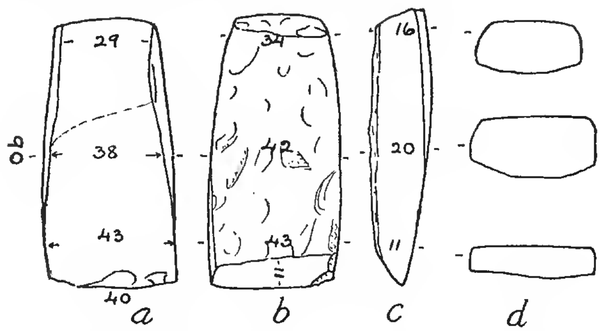


FIGURE 183.—Adz, Type I, with sides ground (L. 1473): *a,* front; well ground, upper part at slightly different plane; side surfaces show as narrow strip due to steeper slope formed by grinding; front edges more regular with chipping irregularities removed; *b,* back; surface evenly chipped level, resulting in regular chin, though higher on one side; *c,* side well ground to remove all depressions; back edge, regular, with very little of back showing owing to improved level chipping; *d,* sections, showing steeper slope of ground sides, practically vertical on right of middle section.

A further progression in grinding includes the back as well as the sides which occurs in an Upolu adz, also of Type I. (See fig. 184.)

The two preceding adzes though typical in shape to Type I have introduced new departures in the extra employment of grinding. The application of grinding to all surfaces leads the way to Type III.

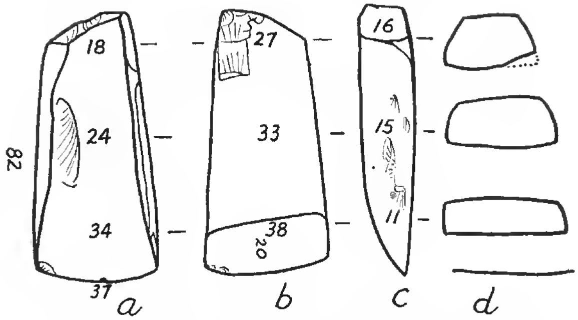


FIGURE 184.—Adz, Type I, with grinding of sides and back (C. 783) : *a,* front, surface well ground, some slight depressions remain, narrow towards poll; front edges, regular; both side surfaces seen; *b,* back; surface well ground throughout, flat in both directions; chin straight clear cut, slightly oblique but parallel with cutting edge; *c,* side surface well ground but some slight depressions left; back edges clean cut but back surface not seen owing to flat grinding of the back; *d,* sections; middle sections show sides are ground convex transversely.

Type III. Adzes (Pl. XXXVI, *C*). Adzes of Type III are quadrangular and well ground on all surfaces except the poll. The back is still wider than the front but the difference is not so marked as in Types I and II, owing to the steeper transverse slope of the sides. The narrowing of the adz towards the poll is not so marked as in the previous types. All longitudinal edges are straight and the chin is marked and straight horizontally. The front, back, and sides are convex transversely and the front and back slightly convex longitudinally. A good example from Tau is shown in figure 185.

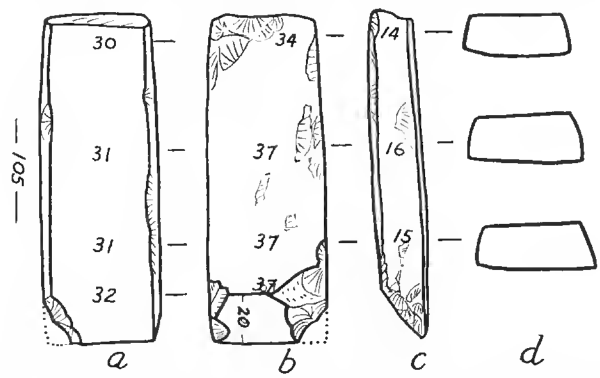


FIGURE 185.—Adz, Type III (C. 586) : *a,* front; the well ground surface shows only 1 mm. difference in width between the lower end and the poll; front edges, clearly defined and fairly even part of the sides show up; poll slopes backward and upward; *b,* back, surface ground throughout though a few depressions remain, convex in both directions; one corner broken off; chin well marked, straight horizontally; *c,* sides, well ground slight depressions remain; narrow strips of front and back show owing to their transverse convexity; thickness, fairly even throughout; *d,* sections; sides, steep slope, slight difference in thickness and slope on either side.

The lower end of a broken adz from Savaii confirms the type. (See fig. 186.)

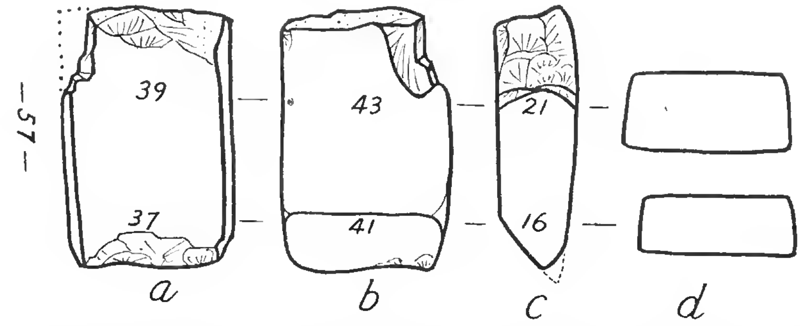


FIGURE 186.—Broken adz, Type III (C. 796): *a*, front; well ground, lower end narrows slightly; front edges straight; sides narrow strip showing; *b*, back well ground clear cut back edges; chin well marked and horizontal; *c*, sides; well ground, all depressions removed; angle of chin, marked; *d*, sections steep sides and fairly straight transversely.

The Savaii broken adz shows the culmination of grinding for Samoa. The removal of all depressions frees the longitudinal edges from the irregularities observed in the preceding two types. Broken adzes of the same type have been found in both eastern and western Samoa which warrants their being regarded as a distinct type and not merely sporadic improvements of Type I.

In the three types of adzes described, the common feature is that the back is wider than the front. A reversal in the width of the two surfaces marks a new type.

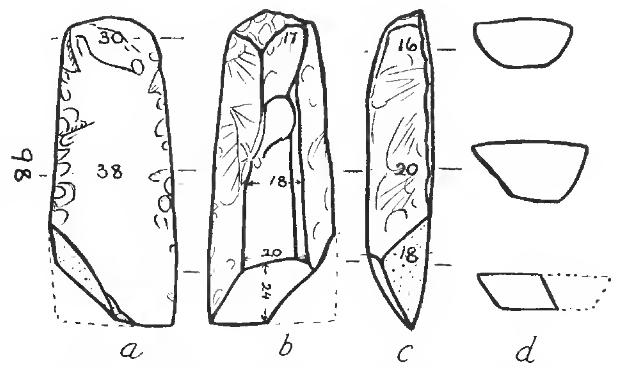


FIGURE 187.—Adz, Type IV, subtype a, reverse quadrangular (L. 2186): *a*, front, surface well ground but slight hollows left near edges, narrows towards poll; broken off; *b*, back, surface narrow, well ground except for hollow towards poll; back edges, distinct but irregular on left owing to uneven chipping; side surfaces show up owing to marked inward slope of sides; bevel well ground with arched chin, irregular chipped poll surface; *c*, side fairly well ground but all hollows not removed; *d*, sections; top shows transverse convexity of sides, middle section shows different slope of the two sides.

Type IV. Adzes (Pl. XXXVI, *D*). In adzes of Type IV, the sides instead of sloping outwards from the front, slope inwards and backwards. The inward slope is not a mere accident due to overgrinding past a right angle, but is due to deliberate technique to make the back narrower than the front. It is thus a reverse technique to that of the three preceding types. The inward slope is marked so that the sides form acute angles with the front at the front edges. The slope of the sides may end in longitudinal edges which define a narrow back surface or the slope may be continued to form a rounded back without edges. The treatment of the back results in two subtypes.

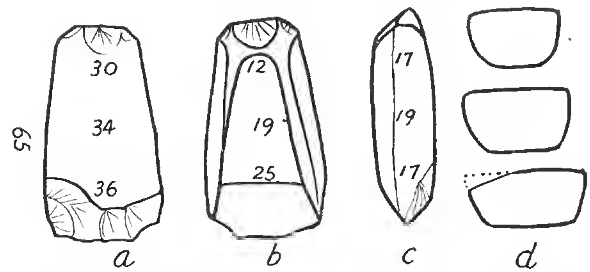


FIGURE 188.—Adz, Type IV, subtype a, reverse quadrilateral (C. 794): *a*, front evenly ground throughout, convex in both directions, sharply defined straight front edges; *b*, back, evenly ground, rounds off towards the poll; back edges distinct but slightly rounded off towards the poll; sides steeper; bevel well ground regular shape, straight chin; poll slightly touched up by grinding but surface occupied by hollow of a large flake; *c*, side well ground; *d*, sections show transverse convexity of sides, each with different slope.

Type IV, subtype *a*. The subtype may be termed the reverse quadrilateral as the front is wider than the back. The sides slope inwards and meet the narrower back surface in distinct back edges. An adz from Tutuila illustrates the subtype. (See fig. 187.)

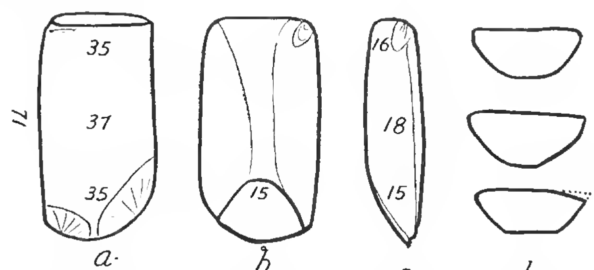


FIGURE 189.—Adz, Type IV, subtype b, rounded back (C. 794): *a*, front, wide even surface well ground; poll surface with slight upward and backward slope; lower edge broken away; *b*, back, well ground throughout; slight indication where back edges were ground off; bevel well ground, forms distinct edge with rounded back; *c*, side shows all hollows removed by grinding; *d*, sections show rounded back with slight flattening in the middle.

A small Savaii adz shows regular technique but the lower end is broken off. (See fig. 188.)

Type IV, subtype *b*. In the second subtype there are no posterior longitudinal edges and the sides and back form a continuous rounded surface. A small Savaii adz illustrates the rounding off of the back edges. (See fig. 189.)

A small adz from Tau shows the range of the subtype. (See fig. 190.)

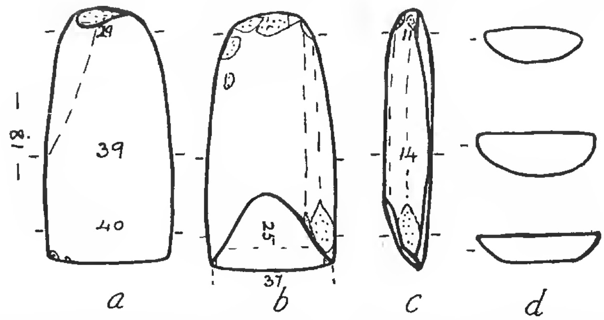


FIGURE 190.—Adz, Type IV, subtype b (B. 8936): *a*, front, wide even surfaee rounded off toward poll, well ground, slightly different plane on upper left; *b*, back rounded but more sharply convex on right, well ground; bevel well ground with arched chin; *c*, side well ground throughout but chipped at lower end; *d*, sections show general convexity with sharper curve on right of middle section.

A fragment from Tutuila is perfectly ground throughout and forms an intermediate between the two subtypes. (See fig. 191.)

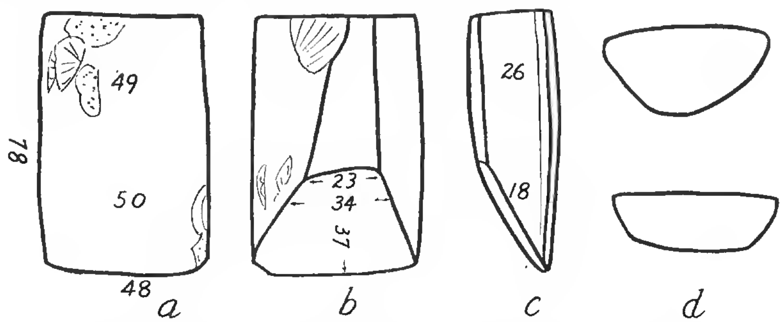


FIGURE 191.—Adz, Type IV, intermediate between subtype a and b (C. 320): *a*, front, well ground, narrowed at edge and towards poll; *b*, back distinct longitudinal edge on right, other parts rounded off except for short edge meeting bevel; well ground throughout, bevel well defined with chin; *c*, side well ground; *d*, sections show rounded back.

Four adzes of Type IV were picked up on Manase, Savaii, and the presence of well-made specimens in Tutuila and Tau show the distribution of the type through the Samoan group.

Type V. Adzes (Pl. XXXVII, *A*). Two adzes, showing the reverse form to Type IV, have been grouped in Type V. One of them from Tau looks

like a waterworn stone that has been ground at the back to form a posterior surface, from which a bevel has been ground to form a cutting edge, which is, unfortunately, badly chipped. The type thus has a rounded front which merges into the sides without front edges. The back has a well-ground surface bounded on the sides by distinct back edges. (See fig. 192.)

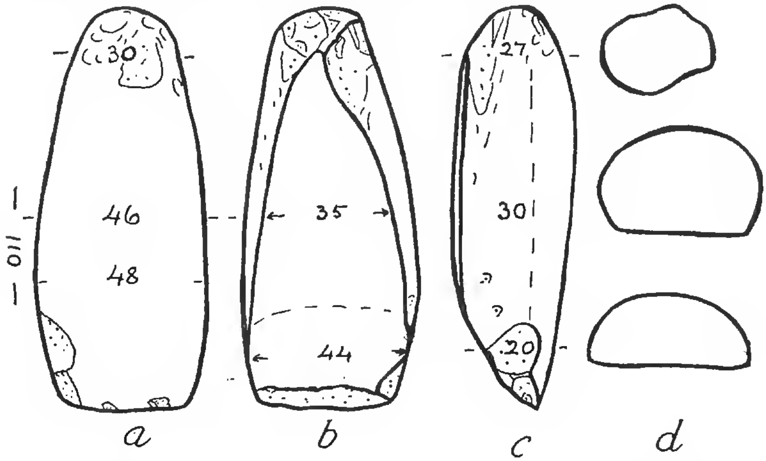


FIGURE 192.—Adz, Type V (L. 1491): *a,* front, well ground throughout; convex longitudinally and markedly so transversely, no front edges; narrow to a rounded poll; *b,* back surface well ground, narrowing to poll, marked back edges; rounded sides visible to outer side of back edges; bevel ground and rounded off into back with no distinct chin; *c,* side shows continuation of front and back in same transverse convexity; *d,* sections, middle shows rounded front and sides with back edges formed with flat back; bevel surface concave transversely.

A longer and more slender adz from Savaii further illustrates the type. (See fig. 193.)

Both the preceding adzes have a curved cutting edge. A much thinner adz from Tau conforms to the type feature of a rounded front but the transverse convexity is more marked at the sides. (See fig. 194.)

TRIANGULAR ADZES

Adzes which are triangular in a typical cross section taken through the blade above the bevel, are usually termed triangular adzes. The triangular cross section must be obtained by purposive chipping to obtain three surfaces. Sections through the butt are not always typical of construction. In some quadrilateral adzes of Type I, sections of the butt near the poll may be triangular owing to the rough chipping methods employed, or to the hammering process of breaking the rock into the pieces required. Of the three surfaces in triangular adzes, two always form the sides while the third may form either the front or the back. In adzes with a front surface, the median ridge

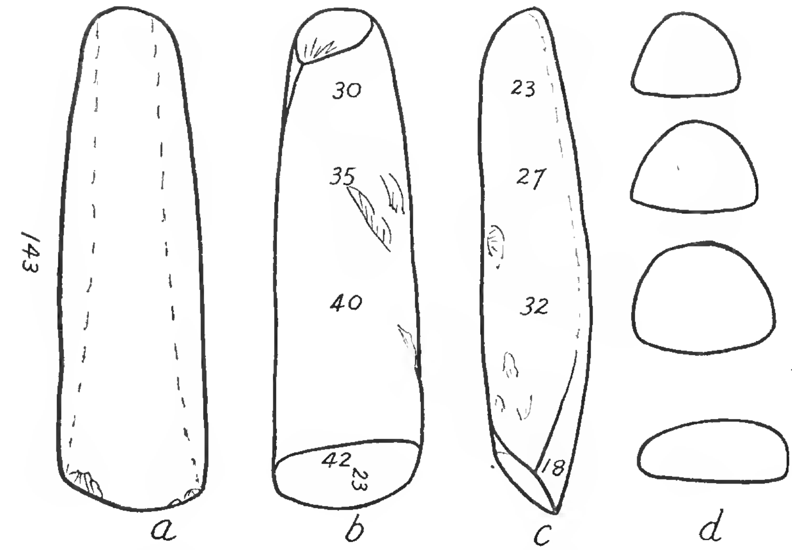


FIGURE 193.—Adz, Type V (C. 807): *a*, front evenly ground throughout, narrows towards poll; *b*, back well ground meets sides in distinct longitudinal edges; bevel convex in both directions with slightly oblique chin; *c*, side, shows front longitudinal convexity and rounding off of front and sides without front edges; *d*, sections, showing front transverse convexity merging into sides; back slight transverse convexity; back edges distinct.

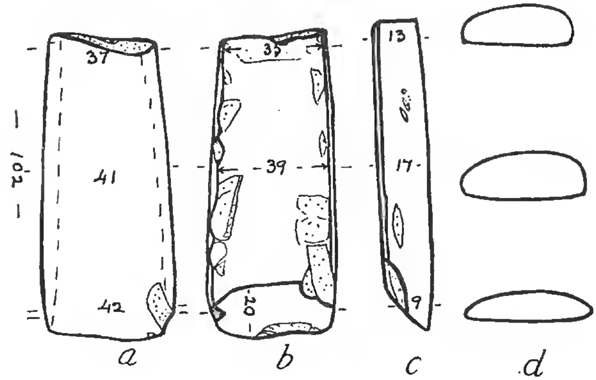


FIGURE 194.—Adz, Type V, variation (L. 1472): *a*, front partly flat transverse convexity sharper towards edges, well ground, narrows towards poll; *b*, back, slight transverse convexity, well ground but marred by flake depressions; back longitudinal edges well defined except where interrupted by hollows of deep chipping; bevel, level transversely and slightly convex in other direction; straight chin; curved cutting edge; *c*, side. thin, well ground, shows part of back; *d*, sections show nature of front transverse convexity, with rounded sides ground inwards slightly to back edges.

formed by the meeting of the sides is on the back and in those with a wide back surface the median ridge is in front. (See fig. 172.)

Two problems arise with the two classes of triangular adzes; hafting, and the formation of the cutting edge. In adzes with a wide back surface, hafting presents no difficulty as the flat back of the butt will rest naturally against the foot of the haft. The problem of the cutting edge has to be met by chipping and grinding the lower end of the front median ridge into a surface wide enough to form a transverse cutting edge with the bevel from the back. In adzes with a wide surface in front, the cutting edge is provided for by the technique used in quadrangular adzes, but the presence of the median ridge on the back requires special technique in hafting.

Of triangular adzes with the wide surface at the back, two well-established types occur in Samoa. Of the class with the wide surface in front, one solitary example occurs in the Bishop Museum collection. As Samoan adz technique is more primitive than that of other Polynesian areas with stone available, the triangular adz with the wide surface at the back would appear to be the more primitive form, and the reversed form with the wide surface in front may be regarded as a later development which reached its highest form in the Society, Cook, and neighboring islands.

Type VI. Adzes (Pl. XXXVII, *B*, 1). The triangular adzes grouped under Type VI have a wide surface at the back and a front median ridge chipped and ground at the lower end into a fairly wide triangular front surface to provide a fairly wide cutting edge. The width of the adz is greater than the thickness. A chipped, unfinished adz from Savaii illustrates the type. (See Pl. XXXVII, *B*, 1, and fig. 195.)

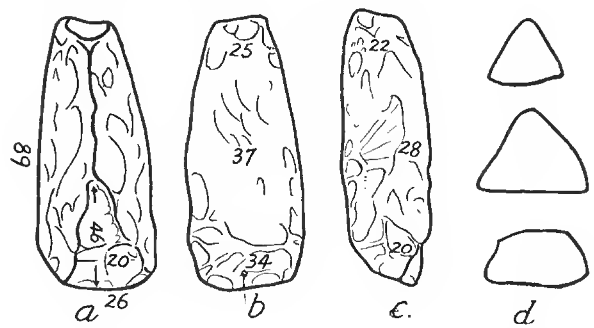


FIGURE 195.—Triangular adz, Type VI, unground (C. 825): *a*, front; median ridge formed by meeting of sides, chipped away at lower end to form triangular front surface with base below to meet bevel; *b*, back; wide surface chipped level to meet sides at posterior edges: bevel chipped away ready for grinding which would result in a horizontal chin; *c*, side; showing sloping of lower end for front surface on right and bevel on left; *d*, sections, triangular, showing back surface and meeting of sides in front median ridge; section through bevel, quadrangular.

Of five large triangular adzes of this type in Bishop Museum, two are chipped ready for grinding. In both, the two sides are chipped to meet in front in a sharp median ridge with the lower part chipped to form a triangular front surface with the base below. The other three adzes are ground in front, not only over the triangular surface below, but also along the median ridge which is converted into a narrow upward continuation of the front surface. An adz from Tau illustrates the typical treatment of large triangular adzes of Type VI. (See fig. 196.)

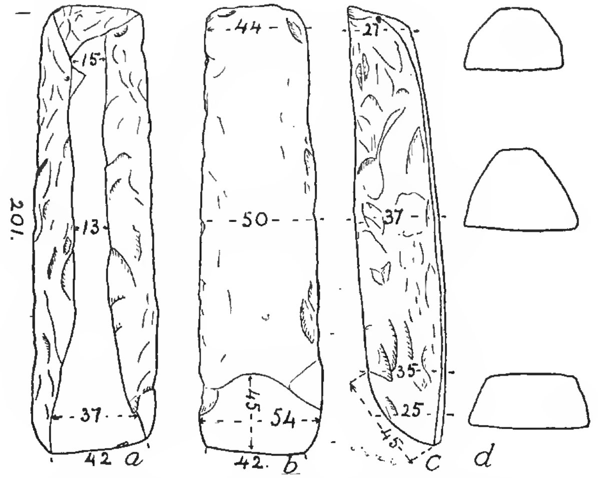


FIGURE 196.—Large triangular adz, Type VI: *a*, front, lower triangular front surface well ground continued upwards by grinding away the median ridge; sides evenly chipped; poll, triangular surface; *b*, back, wide surface bounded by back edges, evenly chipped, convex transversely; bevel well ground, rounded off on to back; *c*, side showing chipped surface and part of front ground surface, also convexity of bevel from above down; *d*, sections; showing typical triangular form with front median ridge ground off to form narrow front surface, which expands in lowest section through bevel.

A study of the large adzes shows that if they were cut off below the apex of the triangular front surface, they would resemble the shorter adzes of Type I, wherein the chipping narrows the front surface towards the poll. In some adzes of Type I, it has been noted that the sides actually meet in front and make the poll end sometimes triangular in cross section. With longer pieces of stone, the tendency in Type I has the opportunity to develop and the two sides meet above the apex of the front surface to be continued upwards as a median ridge in the large adzes. Large adzes in which the chipping of the two sides does not meet, constitute Type I, but those in which the chipping of the sides does meet in front, belong to Type VI. The large adzes of Type VI may therefore be regarded as being derived from the smaller adzes of Type I.

Type VII. Adzes (Pl. XXXVII, *B*, 2). Adzes grouped under Type VII resemble Type VI in having the wide surface at the back and in the treatment of the lower end of the front median ridge to provide a triangular front surface to oppose the bevel in forming the cutting edge. They differ in being relatively much thicker and narrower. As a consequence of the general decrease in width, the front triangular surface and the cutting edge are also relatively narrower. The type is well established with 2 examples from Manua, 7 from Tutuila, and 1 from Upolu. A well-finished adz from Tau illustrates the type. (See fig. 197.)

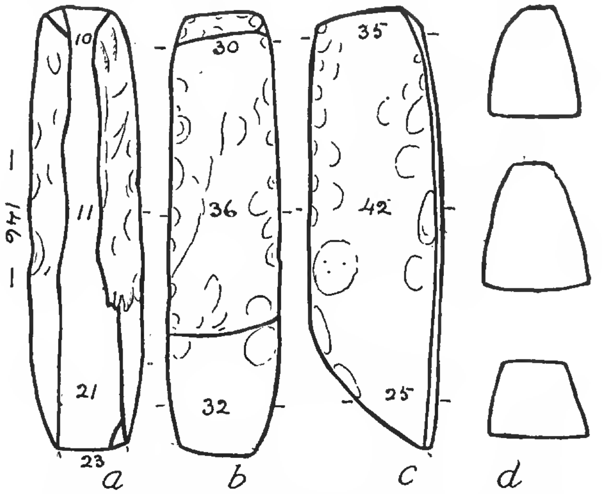


FIGURE 197.—Triangular adz, Type VII (B. 8940): *a*, front; narrow well ground front surface with narrow cutting edge below and forming narrow strip towards the poll owing to grinding of front median ridge; well chipped sides, showing lower curve towards cutting edge due to bevel grinding; *b*, back well chipped wide surface, bounded by back edges at the sides; well ground bevel with slightly inclined chin; poll surface inclined forwards and upwards; *c*, side well chipped, showing thickness of adz and bevel convexity from above down; front, convex longitudinally; lower end touched up on grinding stone; *d*, the sections show transverse convexity of sides, wide back, narrow front, and relative thickness. The thickness is greater than the width.

A broken adz from Upolu shows less relative thickness, but the other type features are present. (See fig. 198.)

Type VIII. Adzes (Pl. XXXVII, *B*, 3). Adzes forming a reverse triangle with the wide surface in front are not only the last type but also the rarest form in the collection. The one example was secured in Fitiuta, Tau. The front forms the widest surface of the adz. The front narrows but slightly towards the poll, is convex in both directions, and is bounded on both sides by sharp front edges. The sides are ground as well as the front, but some of the deeper hollows still remain. The sides slope inwards and backwards to

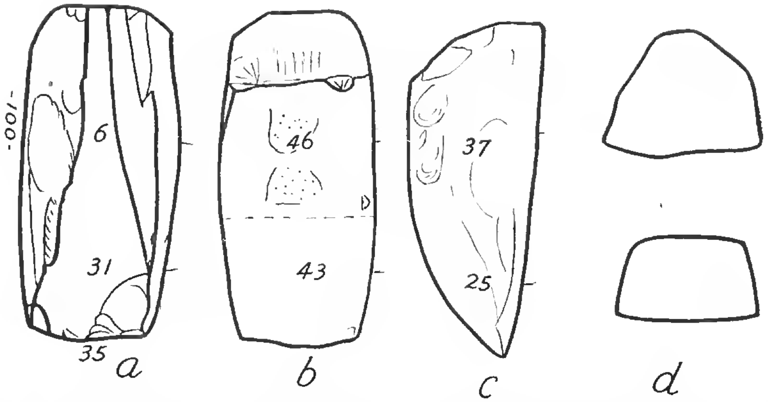


FIGURE 198.—Triangular adz, Type VII, broken lower end (C. 781): *a,* front; narrow, well ground, triangular front surface, continued upwards into narrow strip, narrow cutting edge; sides chipped, curving in to lower edge; *b,* back; well ground bevel, rounded off on to back, no chin; *c,* side; chipped surface, bevel, convex from above down; *d,* sections; upper, shows triangular feature with irregular sides; lower section, quadrangular through bevel.

meet in a median ridge on the back. The ridge, however, has been ground down throughout its length into a narrow posterior surface. The bevel, convex in both directions, is triangular in shape, being bounded by the cutting edge and the inclined sides which reduces the chin to the short part formed by grinding down the median ridge. The poll is triangular but rough, owing to the removal of a large flake, and it slopes forwards and upwards. The butt is a continuation of the blade without any trace of a tang. (See figure 199.)

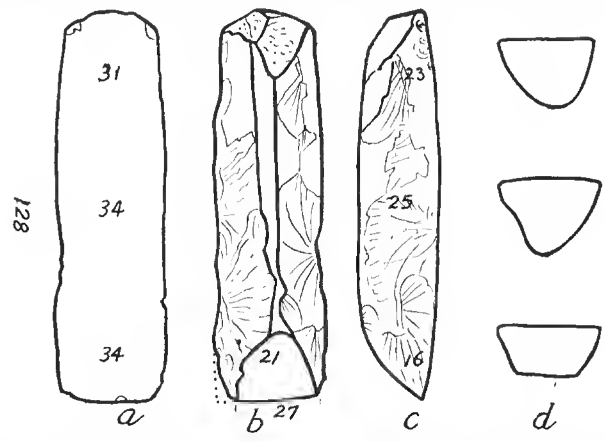


FIGURE 199.—Adz, Type VIII, reverse triangular (C. 584): *a,* front, showing wide surface, well ground; *b,* back showing median ridge ground down to narrow surface, side surfaces, triangular bevel with short chin; and rough triangular poll; *c,* side; *d,* sections showing wide surface in front.

Large adzes. The collection contains 9 adzes, of which three are quadrangular, belonging to Type I, five are triangular adzes of Type VI, and one triangular of Type VII.

Very small adzes, which are plentiful, are usually well ground on all surfaces except the poll, though occasionally a hollow too deep to remove may be left, especially on the back. In shape, they group under Types I, III, and IV. An example of Type I is shown in figure 200.

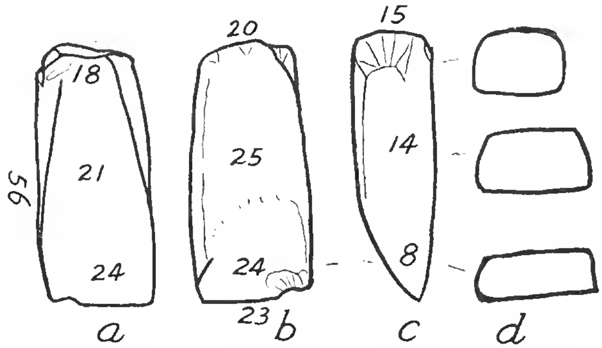


FIGURE 200.—Small adz, Type I (B. 8801): *a*, front, surfaee narrowing towards poll; sides showing at upper end; *b*, back, bevel rounded off; *c*, side; *d*, seetions show outward slope of sides to wider baek, well ground on all surfaees.

Owing to the more extensive use of grinding, adzes of Type I shade off into Type III, of which a fair example is shown in figure 201.

An example of Type IV, subtype *a*, is illustrated in figure 202.

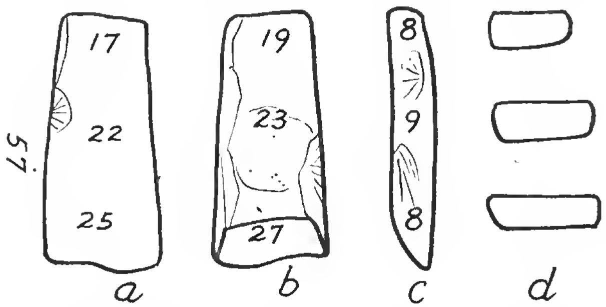


FIGURE 201.—Small adz, Type III (L. 1545): *a*, front; *b*, back, well ground exeept for large shallow depression; bevel with horizontal ehin; *c*, side; well ground, but depressions left; *d*, seetions show transverse eonvexity of sides and less outward slope.

Shell adzes. Two shell adzes are in the collection of Bishop Museum. The larger one (2973) bears a superficial resemblance to adzes of Type I, in that the sides slope backwards and outwards, and the front, owing to the convergence of the sides towards the poll, is triangular in shape. The back is

rounded. The shell, however, is a piece that has been shaped by wave action and grinding has been applied to the lower end in front and with a bevel to form an edge. The smaller adz (2183) shows more grinding in front. The sides are rounded without front or back edges. The poll is pointed. The large adz weighs 19 ounces and the smaller, 5.5 ounces.

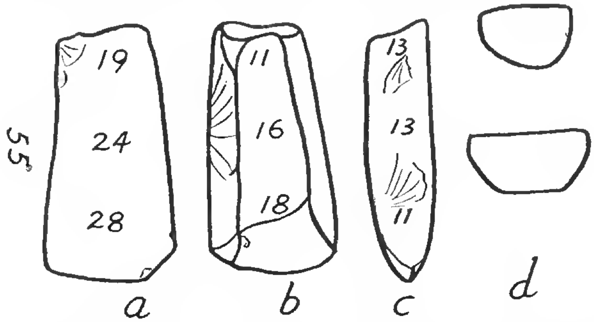


FIGURE 202.—Small adz, Type IV, subtype a (L. 2031): *a,* front, wide surface well ground; *b,* back; surface narrower than front, back edges separating back surface from sides; bevel rounded off, no chin; *c,* side, well ground; cutting edge broken; *d,* cross sections showing narrower back with sloping in sides.

SUMMARY OF TYPES AND TECHNIQUE

Diagramatic cross sections of the types and subtypes described, illustrating the fundamental differences between them, is shown in figure 203.

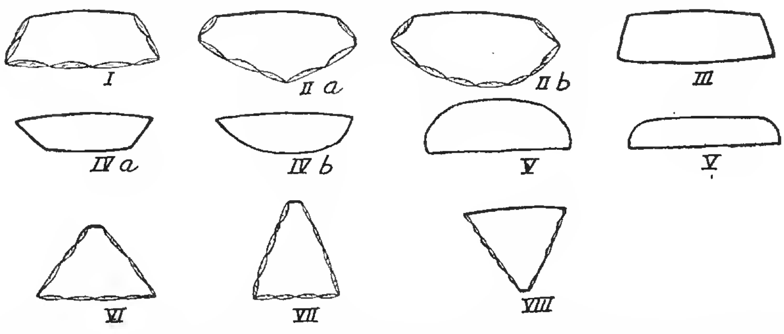


FIGURE 203.—Adz cross sections of types. The plain lines denote grinding and the curves chipping. The relationship between Types 1, 2, and 3 is obvious. Type 3 is merely Type 1 ground on all surfaces as intermediate types have shown but better grinding follows on better shaping by chipping and the butt receives better attention. Type 4 is Type 3 reversed with the back longitudinal edges distinct (4, a) or ground off (4, b). Type V is a distinct type evidently for the purpose of getting a curved cutting edge. The variation V, b, can be derived from a thin quadrangular adz of Type III but as the front longitudinal edges are deliberately ground off to provide a curved cutting edge, it is classed with Type V. The triangular adzes of Type VI have affinity with the adzes of Type I as pointed out. Type VIII in cross section is Type VII reversed. Type VII is distinct from Type VI.

Intermediate types. Adzes intermediate between Types I and II are quite common and are illustrated by cross sections in figure 204.

A number of small adzes from Mr. Anunsen's plantation, Savaii, are well ground front and back, but show much variation in the treatment of the sides, some of which is probably due to the way the stone broke off the larger piece.

The outstanding feature of Samoan technique is the rough chipping, the reduction of grinding in the common types to the minimum, and the absence of bruising and pecking. The chipping is especially coarse on the butt part of the adz. Even in well-ground adzes it is rarely that all depressions are ground out. The order of grinding, as proved by numbers of adzes in various stages of finish, was the anterior surface first, the trimming of the sides next, and the bevel surface to form the cutting edge last.

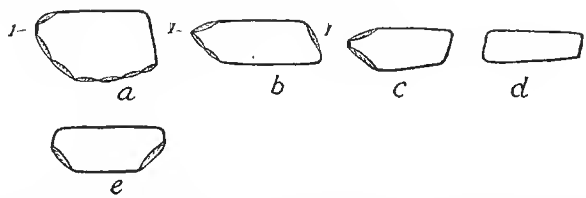


FIGURE 204.—Cross sections, intermediate types: *a* (C. 322) shows the steep side on the right, typical of Type I but on the left are the two series of flaking typical of Type II, with the intervening ridge (1) ground off. The right side is also ground. *b* (C. 792) follows Type I on the right and Type II on the left. The lower part of the right side is ground but the edge (1) between the flaking on the left has not been retouched by grinding. *c* (C. 791) follows Type II on the left with the intermediate edge (1) ground off whilst the right side has been ground backwards and inwards as in Type IV, a. *d*, (C. 793) is a quadrilateral adz well ground on the four surfaces. On the left, it follows Type III but on the right, the grinding passes the perpendicular and slopes inwards as in Type IV, a. *e* (C. 341) from Tutuila shows the reversed quadrangular Type IV, a, with front and back ground and the sides chipped backwards and inwards but with the upper part ground. Attention has been drawn to adz C. 320 which is intermediate between IV, a, and IV, b. See fig. 191.

Samoan adzes come under the class of tangless adzes. Linton (19, p. 325) states that tanged adzes are rare in Samoa, but none of those in Bishop Museum is a true tanged adz. The technique of Types I, II, and III, is directed towards narrowing the butt towards the poll. The removal of large flakes gives the butt a rough appearance, which is utilized in hafting and purposely left rough. If some larger flake depressions cause a narrowing resembling a tang it is the result of over-chipping and not a deliberate technique to form a tang. Some adzes have the front of the butt towards the poll at a more posterior plane than the anterior ground surface, but this again is due to a slope in the piece of stone due to the general process of hammering. Any narrowing of the butt marked enough to raise the question of a tang is due to accident or coincidence and not to deliberate technique aimed at forming a distinct tang.

Another feature is that by far the greatest number of adzes are quadrilateral and deliberately chipped to make the front narrower than the back. Skinner (31, p. 350) includes the common Samoan type in his general Polynesian Type II, which are quadrilateral with the sides converging towards the back. He regards the Samoan adz as a marked variant, for, in speaking of his Type II he states, "In Tonga and Samoa it is strongly dominant, though in Samoa it appears as a marked variant, with the sides converging toward the front." It may be a variation as regards comparisons with quadrilateral adzes in other areas, but in Samoa it is the common form and should be regarded as a distinct type. Samoan stone technique is so crude as compared with that of other Polynesian areas that the common Samoan quadrilateral form with sides converging to the front might well be considered as the more primitive type. In evolving a simple technique to provide a broader cutting edge, the reversed quadrilateral with the broad surface in front marks a distinct advance on the Samoan type. In a similar way, the reversed triangular form in the Society Islands and neighboring islands marks a later advance on the triangular form with the base posterior, though the latter with a narrower edge persists for a specific purpose, which may be the cutting of grooves. Old Samoans have stated that the method of cutting out large pieces of timber was to cut parallel grooves and then chip out the intermediate part. For cutting out grooves, the deep, heavy, triangular adz with a narrow cutting edge, as in the widely spread Samoan Type VII, would be very useful. Some important need was served by the type. For other work the broad cutting edge was evidently preferred. The Society Islands and neighboring groups obtained the broad edge by using the reversed triangle and New Zealand by using the reversed quadrangle. For obtaining a broad cutting edge, both the Hawaiian and New Zealand quadrangles are improvements on the Samoan quadrangle. It is because of this important advance in technique that the common Samoan quadrangular form should be regarded as a distinct type marking a stage in adz technique.

That the Samoan was on the way to obtaining the broad cutting edge of other areas is shown by the occurrence of the reversed quadrangle in Type V, and the reversed triangle in Type VIII, though only one example of the latter has come to hand.

ADZ HAFTING

The haft (*'au*) is usually made of *toi* wood. A branch of suitable size for grasping is selected, after estimating the suitability of the upper angle that it forms with the tree trunk. The trunk is cut transversely 2 or 3 inches above the branch junction and about 1.5 to 2 inches below it. The transverse cuts or scarfs are made about 2 inches deep or more and a piece of the trunk about 6 to 7 inches long, 2 inches thick and 2.5 inches wide is removed with the

branch. The branch is cut off to form a shaft 10 to 13 inches long. The trunk part is reversed so that the upper acute angle is below and the wood is shaped to form the foot of the haft.

Terminology. The haft is described in the position for use, with the shaft to the back and the acute angle formed by the shaft and the foot, below. The terms used may be followed out in figure 205.

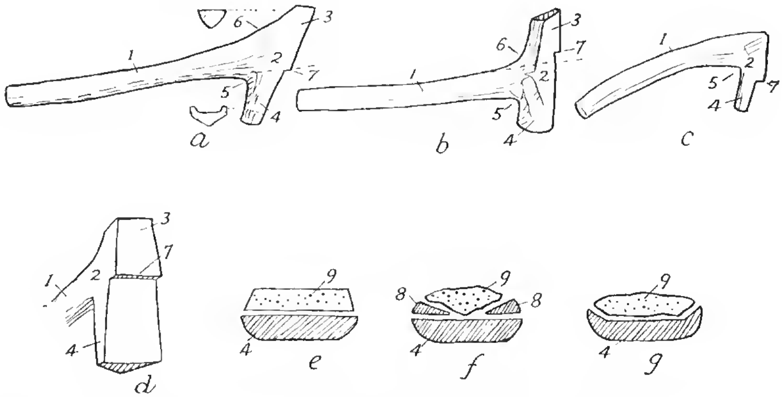


FIGURE 205.—Adz hafts types, terminology and fitting of adz to haft: 1, shaft; 2, foot; 3, heel; 4, toe; 5, heel angle; 6, toe angle; 7, shoulder (*le'i*); 8, wedges (*mata lafi*); 9, adz cross section; *a*, haft, side view; illustrating acute toe angle; shoulder in lower line of shaft; *b*, haft, side view; wider toe angle with more upright foot; high shoulder above upper line of shaft; toe, 1.25 inches deep, 2.3 inches wide; *c*, haft side view; no projecting heel; low shoulder below toe angle; toe, 1.75 inches deep; *d*, haft foot; showing shoulder with front surfaces at different planes above and below; *e*, cross section, toe and adz; toe, flat front; adz, flat back; *f*, cross section, toe and adz; toe flat front; adz with back median ridge; *matalafi* wooden wedges to fill space between adz and toe; *g*, cross section, toe and adz; toe with front hollowed out to fit back of adz.

The shaft is the part of the haft grasped by hand to swing the adz. It is formed from the selected branch.

The foot is the part of the haft set at angles to the shaft. It supports the adz and the lashing and is formed from the wood cut out of the tree trunk.

The heel is the upper part of the foot. It forms an obtuse angle with the shaft which may be trimmed off into a curve or the upper line of the handle may be continued to meet the front of the foot and so remove the projecting heel. The heel has a flat front surface which narrows towards the top. The sides of the heel are convex transversely and usually meet in a posterior median edge which runs up from the top of the shaft junction. The cross section is thus triangular. The sides also narrow but instead of reaching a point, the end of the heel is cut off with a forward upward slant to form an upper triangular surface. In some hafts, the back of the heel is rounded off. The heel gives support to the upper turns of the lashing and was devised

for that purpose. The angle between the heel and the shaft is termed "the heel angle."

The toe is the lower end of the foot and forms the part projecting below the shaft with which it makes an acute angle termed "the toe angle." It supports the adz and must be a little wider than the butt of the adz. The front of the toe forms a surface which is usually flat or may be hollowed to fit the back of the butt. The sides of the toe are convex transversely and may meet in a median edge at the back or form a general rounded surface. The toe is shorter than the heel and supports the lower turns of the lashing. In adzes without a projecting heel, the toe is longer and may support the whole of the adz butt.

The front of the foot, including the heel and toe parts, is dubbed out in one plane. The adz butt is laid upon it and the craftsman decides how much of the adz will be included under the lashing. A mark is made where the poll ends. A transverse cut is made and the part of the surface below it is removed to form a deeper plane, the depth of which depends on the thickness of the butt. The right angle formed with the upper plane is termed the shoulder (*le'i*) and it prevents the poll from working upwards under the lashing. The site of the shoulder varies as indicated above with the amount of the adz that the craftsman intends to include under the lashing. In some adzes, the site is in line with the lower line of the shaft (fig. 205, *a*); in others, it is above the upper line of the shaft. (See fig. 205, *b*.) In hafts without a projecting heel, the shoulder site may be below the level of the lower angle. (See fig. 205, *c*.) In the hafted adzes in Bishop Museum, more than half the length of the adz has been converted into butt by inclusion under the lashing, while in the haft, with the shoulder above the upper line of the shaft, no less than 77 per cent of the adz length was converted into butt by the lashing. Two hafted adzes in the British Museum figured by Edge-Partington (10, vol. 2, p. 42) appear to have less than half of the adz length lashed to the foot. My informants maintained that with the longer butt, the chances of the adz breaking were lessened.

Hafting wedges of wood termed *matalafi* (*mata*, an edge; *lafi*, to hide) were used when a butt such as those of Type II (fig. 205, *f*) would not lie evenly against a level toe surface. While a level toe front is suitable for adzes with flat backs (fig. 205, *e*) no amount of lashing alone will keep an adz with a median back ridge or a rounded back in an immovable position on a flat surface. Even in a haft hollowed out with a steel tool by a master carpenter in Savaii, he had recourse to wedges to keep an adz of Type II in proper position. It seems likely that in Samoa, the hollowing out of the foot in adzes hafted for museums and collectors has been due to the acquisition of steel tools (fig. 205, *g*), and that the old method of fitting was by using wedges and a flat toe surface. It was easier to build up a bed for an uneven

butt than to cut one out of the solid to fit exactly. When the foot, adz, and wedges were surrounded by the lashing turns, the wedges were hidden (*lafi*) and for all practical purposes were as good as if they formed a structural part of the toe.

The lashing. To lash is *fafau,* but an adz lashed to a haft is termed *to'i fafao*. The lashing material was always sennit braid. With the adz fitted to the foot and the poll resting against the shoulder, a sheet of the coconut fabric-like material (*lau'a'a*) was laid over the butt with a fair margin projecting down beyond the toe. The material was bound on by the lashing and when the adz was used, the lower projecting part of the sheet was turned back over the lashing to protect it from wearing against the wood being worked.

The lashing turns are arranged to bring out some design and so combine decoration with utility. The commonest hafting design of repeated chevrons consists of a mesial line of crossings which is also used on wall posts. As applied to the hafting of adzes, it is described under figure 206. (See Plate XXXVII, *D,* 2.)

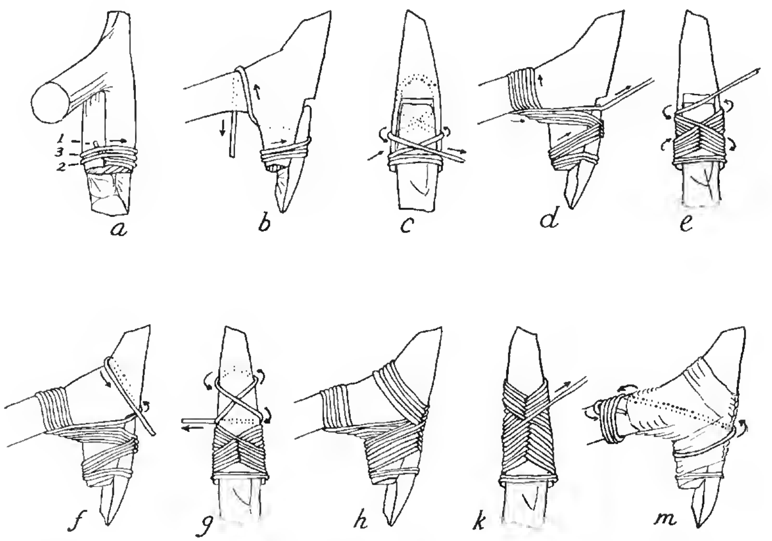


FIGURE 206.—Hafting technique of adz, chevron design: *a,* the end of the braid (1) is fixed at the back of the toe by slanting it obliquely upwards and carrying the braid transversely round to the right near the lower margin of the toe. The braid is carried transversely round the front over the adz and reappearing on the back at the left makes the transverse turn (2) over the oblique end. It passes to the right just above the first turn and continuing round the front in this relationship makes another complete turn (3); *b,* the third turn finishes on the right side of the toe. From there it is carried obliquely upwards across the front of the adz and round the back to the toe angle. It then crosses upwards over the right side of the shaft and is brought round it to the right again; *c,* crossing below the shaft as it crosses to the right, the braid is carried

round the right side of the toe and makes an oblique turn downwards over the front of the adz to cross the ascending turn in the middle line. Below the crossing, it meets the previous transverse turns on the left and is carried round the back just above them; *d*, succeeding turns are now carried on, each close above the preceding oblique turns and proximal turns round the handle. Thus six ascending turns are made from the lower right side of the foot and six descending turns from the upper right side. The crossings are made under the shaft and in the middle line over the front of the adz; *e*, the appearance of the crossings on the front are here shown and completes the lower set of crossings. The braid after the last turn round the shaft is carried obliquely upwards across the front of the adz in a line parallel with the previous ascending turns; *f*, the upper set of crossings is made by taking the turns round the projecting heel instead of round the shaft. Thus the braid from the last ascending oblique turn is carried round the back of the heel and then descends obliquely across the front; *g*, the descending oblique turn crosses the ascending turn in the middle line and passes round the left side of the toe level with the point where the ascending turn appeared on the right side. From there it is taken transversely round the back of the toe to appear just below the first ascending turn on the right. It will be seen that the first crossing of the upper set is a little distance above the last crossing of the lower set. The space between has to be filled in by succeeding turns passing obliquely upwards across the front from right to left, transversely behind the heel, obliquely downwards from right to left and then transversely behind the toe. Each turn instead of being above as in the lower set, follows below the preceding turn in the upper set; *h*, about seven full turns completes the upper set as shown on the side view of the right side; *k*, the completed crossings in front fill up the space denoted in figure *g*. The braid after making the last upward oblique turn is on the left side; *m*, the braid is carried across from the left side to just beyond or proximal to the turns round the shaft. About four complete loose transverse turns are taken round the shaft and the end of the braid passed back towards the heel under the turns. Each turn is then drawn taut commencing with the one nearest the heel. When the last or proximal turn is drawn taut, the braid end is pulled taut towards the heel so as to remove the slack. The end of the braid is thus fixed and any excess cut off close to the turn from under which it emerges. The methods of fixing the commencing end of the braid and the finishing end are the same in all lashings. The use of the upward projecting heel and downward projecting toe can now be appreciated from the lashing point of view.

Another common form of lashing, also used on wall posts, is the single lozenge design in figure 207. (See Plate XXXVII, *D*, 1.)

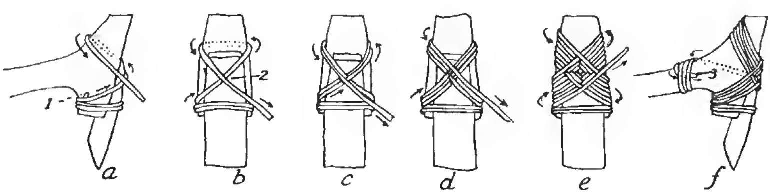


FIGURE 207.—Hafting technique, single lozenge design; *a*, the commencement end (1) is fixed at the back by two or three transverse turns as before. The braid is then carried obliquely upwards from the right and crosses the middle line in front at the spot selected to form the middle point of the lozenge. The oblique turn is continued up round the left side and passes transversely round the back of the heel. It descends obliquely on the right; *b*, descending obliquely from the right the braid crosses the ascending turn in the middle line at the front to form the middle of the lozenge (2). It reaches the transverse turns at the lower left side and passes transversely round the back of the toe; *c*, appearing on the right side the braid ascends obliquely upwards below the previous

ascending turn and passing transversely round the back of the heel descends obliquely across the front below the previous descending turn; *d*, the braid in passing transversely round the back of the toe crosses the previous transverse turn so that it appears on the right above the two previous turns. It makes an ascending oblique turn above the two previous turns and passing behind the heel descends obliquely above the two previous turns; *e*, the turns are continued as in *c* and *d*, first below and then above the previous turns, until eight or more complete turns sufficient to firmly fix the adz are made. The lozenge design develops with the various turns; *f*, the last upward oblique turn is carried on round the left side of the foot and on to the upper part of the shaft. Three or more loose turns are made round the shaft and the end (3) fixed as before.

A more elaborate lashing brings out a double lozenge design. (See fig. 208, and Pl. XXXVII, *D*, 3.)

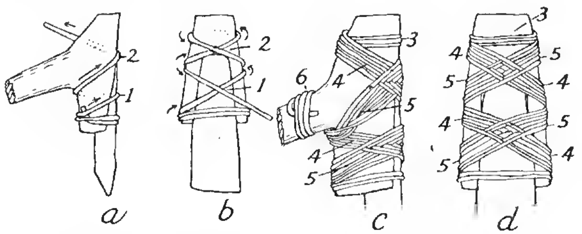


FIGURE 208.—Hafting technique, double lozenge design. Two smaller lozenges are formed on the front of the adz so two points are selected for the first crossings: *a*, the commencement end is fixed with one transverse turn made high up so as to be covered by the lower lozenge. The braid runs obliquely upwards from the lower right side, crosses the lower middle point (1) and passes round the back in the toe angle. Reappearing on the right, it crosses obliquely upwards over the second middle point (2) and passes transversely round the back of the heel; *b*, the braid makes a downward oblique turn from the right, crosses the second middle point (2) and passes transversely round the back of the toe high up. It reappears on the right and descends obliquely over the first middle point (1) and continues down to pass transversely round the back of the lower part of the foot. The two crossings (1 and 2) have now been formed and successive turns are made below and then above the first turns; *c*, after the ascending turn reaches the top the second time, a transverse turn is made round the front of the heel just over the end of the poll and then continued downwards in the oblique turn. Three of these transverse turns are made altogether (3). After the fourth descending turn, a fifth ascending turn is made. Instead of descending again, the braid is continued back over the shaft round which it is fixed with three turns (6) in the usual way. The crossings at the sides close to the shaft are arranged in order so as to form a crossing pattern. The descending turns are marked 4 and the ascending turns, 5; *d*, the appearance of the two lozenges on the front is shown.

In the above three forms of lashing, the use of the heel in making possible the upper turns is obvious. In handles without a projecting heel, the upper turns have to be made around the shaft as in the first stage of the chevron design. (See fig. 206, *d*.) The technique is shown in figure 209.

The Samoan guild of carpenters now use steel plane blades lashed to the old time short handles with sennit braid. The *le'i* shoulder is always used. The carpenters maintain that the lashing designs now used are the old patterns originally used with stone adzes and that they have been transmitted

to successive generations of the guild. As the time sequence has been maintained by continuous use of the short handled adz, there is no reason for doubting their statement.

Another type of wedge termed *olaolatina* was sometimes driven in under the completed lashing to tighten it up if there was any tendency to slackness.

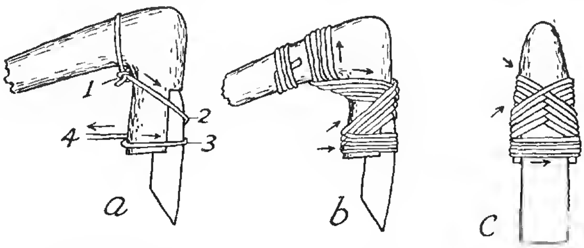


FIGURE 209.—Hafting technique, haft without projecting heel, chevron design; *a*, the commencement end is tied with a running noose round the shaft close up to the foot (1), the braid is then passed obliquely downwards round the right side (2), crosses over the front and makes a complete transverse turn round the lower end of the toe (3). The end (4) is brought round the back to the right side; *b*, the braid makes an upward oblique turn from the last figure to cross the descending turn in the middle line. It passes round the left side of the toe and appearing at the back under the shaft, it makes a complete turn round it ascending on its right side. It then crosses obliquely downwards above the first oblique turn, makes a transverse turn below round the toe and then ascends obliquely above the previous oblique turn. It follows proximally round the handle and continues this for five descending and five ascending turns. After the fifth ascending turn, it passes back on the shaft and is fixed in the usual way; *c*, the appearance in front is shown.

Straight hafts. Though no adzes of the axe type, bevelled from both sides, were seen, Judd (17, p. 41) had two methods of hafting demonstrated to him at Tau, in which the adzes were lashed to a straight handle with the cutting edge in the same axis as the handle. (See fig. 210.)

The name of *to'i laitiiti* given to the slot lashing refers to the type of adz (*laitiiti,* small) and not to the style of lashing. The adz in the split handle was termed *to'i pito tele* (*pito,* navel; *tele,* large) and evidently likens the poll of the adz, as viewed from above, to the anatomical region mentioned.

Reverse hafting. An old man in Tau and a skilled carpenter in Savaii both hafted stone adzes with the bevel surface in front. The Savaii man stoutly maintained this to be the correct method. He produced his kit of tools containing 9 steel adzes all hafted in this manner. He called up other old men who supported his contention. He argued that the bevel surface must be in front to prevent digging in, especially in working on the concave surfaces of canoes, food bowls, and kava bowls. All metal implements used by Samoan carpenters, whether chisels, hatchets, or plane blades, are ground with the bevel in front when attached to short handles for use as adzes. The position was said to be due, not to the change in material but to direct transmission

of the method from the time when stone tools were so treated. Other arguments advanced were that, with the bevel in front, the edge could be resharpened without removing the haft and that the ground front would then rest against the level front of the foot of the haft while the unground back by being in front would better support the lashing turns as they passed directly over it.

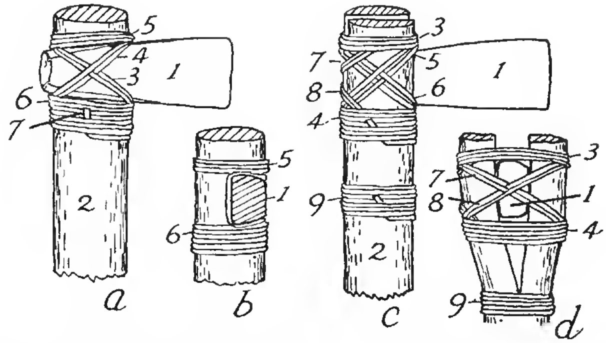


FIGURE 210.—Hafting with cutting edge in axis of handle: 1, adz; 2, straight haft; 4-8, lashing turns; *a*, a transverse slot is cut on one side of the straight haft to fit the butt end of the adz which being narrower at the poll cannot work up when a blow is struck. With the haft upright, the lashing resembles the simple lozenge lashing of wall posts; the adz corresponding to the wall plate and the haft to the wall post. Diagonal turns (3, 4) are made and then the transverse turns above (5) and below (6). A circumferential turn passes round the lashing turns and under the slightly projecting poll. The braid descends on the handle and is fixed by passing back under three loose turns which are then drawn taut over it (7); *b*, shows a view from above with the adz resting in the slot; *c*, second method; the straight haft is split at the end and the adz butt inserted in the split. The two parts of the haft are lashed together first with transverse turns above (3) and below (4) the adz and then with diagonal turns (5, 6) while another diagonal set (7, 8) passes over the poll and assists in preventing displacement when a blow is struck. The lashing is fixed in the orthodox manner. Another set of transverse turns (9) is made lower down the haft to prevent the split working back; *d*, a view from above, showing the diagonal turns (7, 8) crossing above the poll.

The contention is interesting in view of similar opinions held by some of the Cook Islanders (39, pp. 243, 244). Adzes from other Polynesian areas have been recently hafted in the reverse manner. It is possible that some types of adz were hafted in the reverse for special purposes, such as, working concave surfaces. As against reverse hafting in Samoa, adzes from that area have been hafted in the generally accepted manner. Those figured by Edge-Partington (10, vol. 2, p. 42.) were hafted with the bevel to the back, but cannot be accepted as proof for they were not hafted in the period when stone adzes were in actual use. Hafted adzes authentically known to have been collected by the earliest white navigators are the only ones that can settle the question. So little is known about the actual way in which the various types of stone adzes were used, that any theories based by ethnologists

on angles and directions of striking can be no more final than that of an expert Samoan carpenter who lives by making houses, canoes, and bowls with short handled adzes though the implement be of steel instead of stone. Even the proved methods of hafting in other Polynesian areas may not necessarily apply to Samoa, where more primitive types of adz may possibly have carried a different method of hafting. Until positive proof is forthcoming, less confusion is caused by accepting the orthodox method with the bevel to the back.

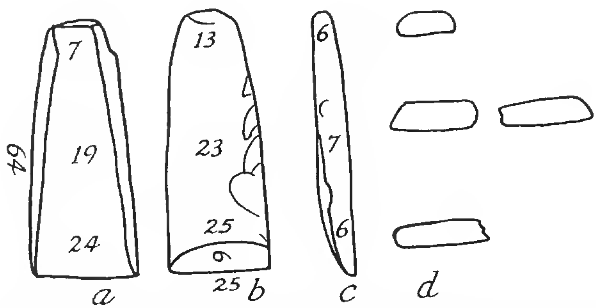


FIGURE 211.—Short quadrangular chisel (L. 1565): *a*, front; well ground surface narrower than back and narrowing towards the poll; anterior edges, well defined; sides showing; poll surface slight inclination upwards and backwards; *b*, back, well ground, depressions on right; bevel surface curved on left; chin distinct; *c*, side, thin, well ground; *d*, sections, different slopes on sides.

CHISELS

"A chisel is a cutting implement which is hafted with its long axis continuous with the long axis of the haft. The motive power is supplied sometimes by pressure and sometimes by mallet blows." The above is the definition of a chisel accepted by the conference on terminology alluded to on p. 334. Long, narrow implements are termed *tofi* by the Samoans, but no accurate information could be obtained as to how they were hafted, or whether a mallet was used. As Samoan carpenters were seen hollowing out bowls with steel chisels and gouges hafted as adzes, it may be inferred that the larger stone implements with fairly parallel sides were also hafted as adzes. Pratt, in his English-Samoan vocabulary (23, p. 90) gives the name for a mallet as *samala la'au* but, as he also gives *samala* as the Samoan form of the English word "hammer," it would appear that the Samoans had no old word for mallet. Failing a true Samoan word for mallet, the inference is that the mallet was not used in Samoan woodcraft. The Samoan *tofi* were therefore probably hafted as adzes, and such as might have been hafted in the same axis as the haft were used with pressure and not with a mallet. Some of the longer ones were probably used with pressure without hafting.

The smaller implements regarded as chisels in appearance may be grouped into, quadrangular, and triangular, and they follow some of the types of adzes. Quadrangular chisels may resemble adzes of Type I in being narrower in front and narrowing towards the poll. A short implement is shown in figure 211. (See Pl. XXXVII, *C*, 2.)

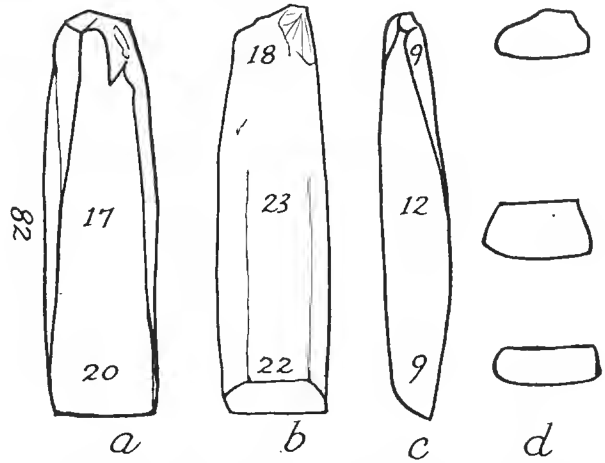


FIGURE 212.—Long quadrangular chisel (L. 1483): *a*, front; narrower than back, anterior edges rounded off towards rough poll; *b*, back; well ground but showing edges between three planes of grinding; chin well defined, conforming to three planes of back; *c*, side; *d*, sections.

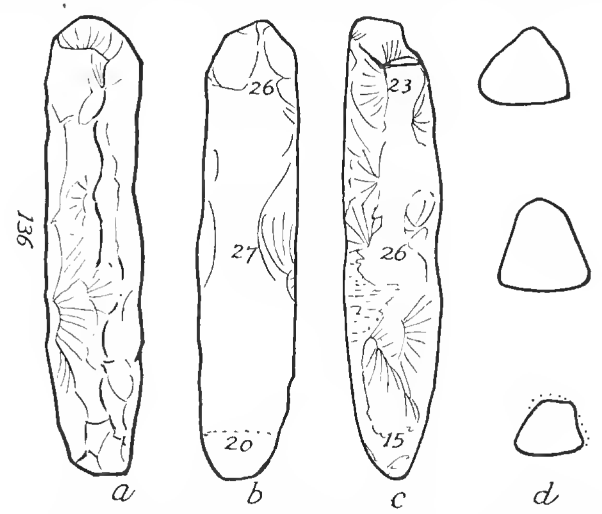


FIGURE 213.—Unfinished long triangular chisel (L. 1476) median ridge in front: *a*, front; two sides chipped to form median ridge in front; lower end curved; *b*, back; shows grinding especially towards lower end to form slight bevel with curved edge; *c*, side, chipped showing depth; *d*, sections, showing triangular character of implement.

A longer quadrangular chisel resembles adzes of Type III, but the back has been ground into three planes towards the bevel. (See figure 212 and Plate XXXVII, *C*, 3.)

Triangular chisels. Many roughly chipped triangular implements were picked up on house platforms. They had no ground edge and resembled large drill points. One, however, that was partly ground, showed that the median ridge was in front. (See fig. 213, and Pl. XXXVII, *C*, 4.)

A broken triangular chisel with more grinding indicates a better-worked specimen of the preceding type. With a narrow triangular surface in front, it resembles adzes of Type VII. (See fig. 214, and Pl. XXXVII, *C*, 5.)

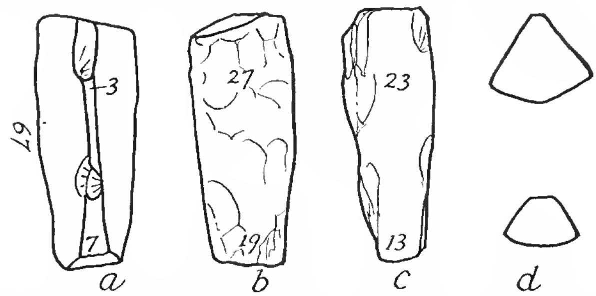


FIGURE 214.—Broken triangular chisel, median ridge in front (C. 345): *a*, front; two sides well ground with median ridge ground to a narrow surface which expands below; *b*, back; wide surface, chipped, sharply defined back edges, bevel broken off; *c*, side; ground narrowing towards lower end; *d*, sections; upper section shows roughly triangular with front median ridge slightly ground down, back irregular; lower section shows expansion of narrow front surface.

Another broken triangular chisel with a wider front surface at the lower end of a front median ridge, and a straight transverse chin, points to affinity with the adzes of Type VI. (See fig. 215, and Pl. XXXVII, *C*, 6.)

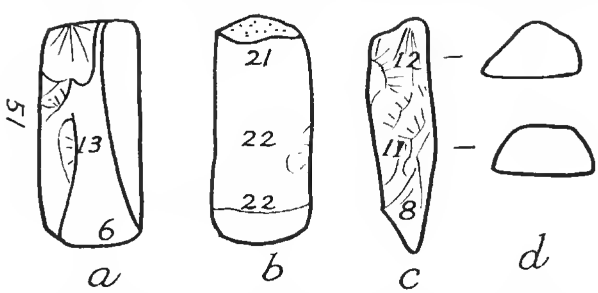


FIGURE 215.—Broken triangular chisel, median ridge in front (C. 330): *a*, front showing median ridge expanding below in a fairly wide front surface; sides chipped but touched up with grinding; curved edge; *b*, back; surface wide and well ground; bevel with curved edge and straight transverse chin; *c*, side, showing chipping also distinct chin angle; *d*, sections; upper, showing triangular section; lower, showing front surface, convex sides and level ground back.

A well-ground but broken chisel shows the reverse triangular form with the back median ridge and a triangular bevel, thus forming affinity with adzes of Type VIII. (See fig. 216.)

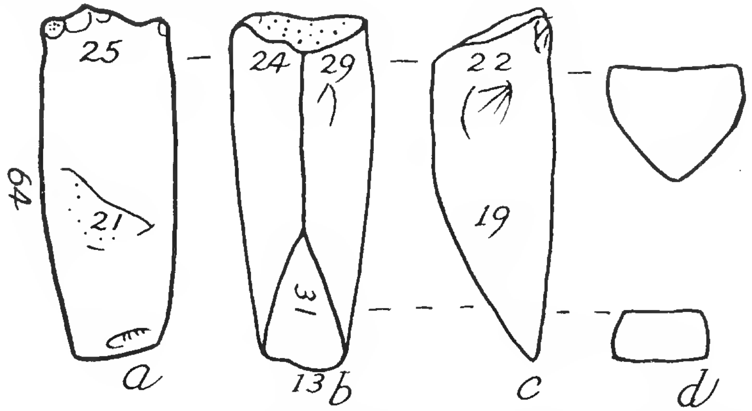


FIGURE 216.—Broken reversed triangular chisel, back median ridge (L. 1555): *a*, front, wide surface well ground, narrow towards edge; *b*, back, well ground sides meeting in median ridge, triangular shaped bevel with chin reduced to a point; *c*, side, deep, well ground, shows chin point; *d*, sections, upper showing typical ridge at back, with convex sides; lower shows narrow section through bevel.

GOUGES

"A gouge is a special form of chisel in which the edge is curved to such a degree that the bevel is hollow or grooved." (Terminology Conference.) No implements in the Bishop Museum collection comply with the above definition. The adzes of Type V have curved edges and may have discharged some of the functions of a gouge. One figured (fig. 192) had a concave bevel. The triangular adzes of Type VII have also a tendency to a curved edge. The triangular chisel in figure 215 has a curved edge. The long chipped implement (fig. 213) also has a curved edge and as it affords a good hand grip, it may have been used with a planing action.

STONE COCONUT GRATERS

A number of pieces of stone picked up on house platforms were found to be flat on one surface and chipped from the other rounded or irregular surface to form a curved edge. The shape was unsuitable for adzes and yet the curve had been deliberately worked. The problem was solved by the Samoans diagnosing them as coconut graters (*tuai ma'a*). Suitable pieces of stone were chipped to form a serrated curved edge which formed a better grater than an even ground edge. The grater was lashed to a wooden stand (*'au sa'alo*) with the flat surface upwards. A fairly thick implement is shown in figure 217.

Old stone adzes, retouched by chipping on the bevel side of the edge were also used as graters. A Tutuilan adz so treated is shown in figure 218.

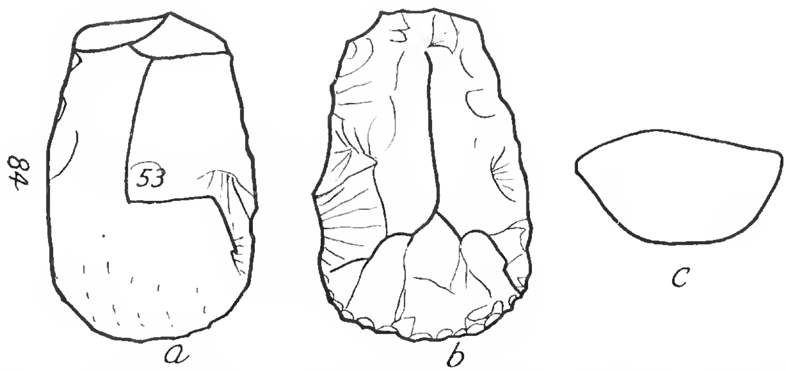


FIGURE 217.—Stone coconut grater (C. 348): *a*, upper surface, fairly flat; *b*, under surface; showing fine chipping to form the grating edge; *c*, cross section; showing fairly flat uppper surface and deep curved under surface.

In Tau, a grater formed from an adz of Type I was lashed with the single lozenge design to a straight handle to demonstrate the method of attaching the stone *tuai* to the arm of the wooden grater stand. (See Plate V, *F*.)

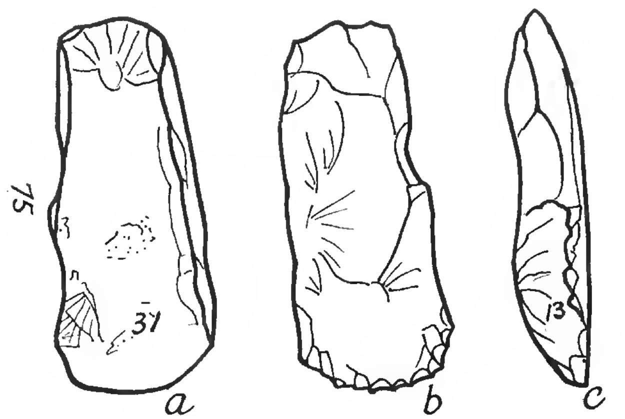


FIGURE 218.—Stone coconut grater formed from adz (C. 587): *a*, upper surface; well ground front of old adz of Type I, showing part of sides, narrowing towards poll; curved edge; *b*, under surface; unground back of adz, bevel ground without distinct chin, edge finely chipped; *c*, side, showing bevel at lower end.

KNIVES AND SCRAPERS

Basaltic flakes, standing out in contradistinction to the gravel, are found on the house platforms. Some of them were probably brought from the

quarry to use as knives and scrapers. Many pieces had concave edges suitable for scraping rounded wood; such as, handles, staffs, and spears. No deliberate retouching of the edges could be made out. Probably any piece that served was used and discarded. For cutting flesh and soft material, bamboo was used, but something must have been used for cutting grooves in shell before the pieces necessary for trolling hooks could be snapped off. Longer flakes with straight or slightly convex edges are to be found among the platform stones.

SINKERS

Net sinkers were selected from suitably sized natural stones. They were firmly tied with a special cord and then tied to the bottom rope of the net. Even the small, rounded, waterworn stones seen on casting nets were held firmly by the tying technique. The stone sinkers of ordinary nets were not treated by grooving. Line sinkers do not seem to have been used in former times because the hooks in use were trolled and did not require sinkers.

Sinkers for shark bait and shark nets. Large waterworn stones, used with set nets with big meshes for catching shark outside the reef, had neat funnel shaped holes bored through from either side with a stone pointed drill to complete the perforation for a rope attachment. In a shark bait sinker (*ma'afa'amalie*) a chipped groove extended from either side of the perforation to meet over the end. (See Pl. XL, *D,* 1.) Mr. Judd (17, p. 641) was informed that it was used to anchor the bait which was tied to the rope in a position where it would be about the middle of the set net. Another stone, with a larger perforation and a groove cut around the end, was used to anchor nets set for sharks, and was hence termed a *taula* (anchor). (See Pl. XL, *D,* 2.)

ANCHORS

Canoe anchors are termed *taula*. Though suitably shaped, natural stones were more commonly used, some such as the anchor of the famous Lauti war canoe that belonged to Faumuina of Aunuu, Tutuila, had a hole bored through for the better attachment of the rope. Smaller stones with drilled holes (Pl. XL, *D,* 3) were said to be tied together to form anchors for the small *paopao* canoes while fishing within the reef.

SQUID LURE SINKERS

Stones shaped like ordinary wooden spinning tops were used in squid lures.

THROWING DISCS AND OTHER ARTIFACTS

Discs (*te'a*) of coral stone, used in the game of *tanga te'a,* were usually selected from flat pieces which had been rounded by wave action, but some are said to have been trimmed to the right shape.

The stone nail figured by Kramer (18, vol. 2, p. 204) as a *fao* is unique and no information could be obtained regarding such objects.

SUMMARY

Samoan stonework is characterized by negatives. In stone structures, cut stone was not used. The stone posts of the Fale-o-le-Fe'e, often quoted as having been cut by human agency, are natural basaltic prisms. The outstanding religious stone structures of eastern Polynesia and Hawaii find no counterpart in Samoa. The Tahitian term of *marae* for such structures exists in the Samoan form of *malae* but the term is applied to an open space in a village where public meetings are held. The Samoan *malae* has the same meaning as the Maori *marae* but though both areas have retained the social significance of the term, the special stone structure associated with it in Tahiti is absent both in Samoa and New Zealand. Samoan religious houses were built on raised stone platforms but both house and platform were directly connected with the technique of dwelling houses and the stone platform underwent no specialization for religious purposes. With the absence of the specialized religious structure in stone is associated the absence of stone images either large or small.

Among the necessary implements, tanged adzes as a form of purposive technique are entirely absent. The most common type of adz are quadrangular with the widest surface at the back. The commonest types are marked by a minimum of grinding, but full grinding on all surfaces except the poll is present in many of the smaller adzes and the less common types. Triangular adzes are characterized by the widest surface forming the back while the reverse is exceedingly rare. In spite of the cruder appearance of the adzes, good work was accomplished with them as evidenced by the technique of the arches of the guest houses and the flanged plank canoes. The aesthetic sense of the Samoan craftsmen did not express itself in stone but sought some other medium. Similarly the pounding of food and other material was performed with natural objects and stone pounders and pestles did not enter into Samoan domestic economy.

CANOES

The Samoans enumerated seven types of canoes differing in size and varying in construction. The different types may be grouped into two main divisions; the dugout, and the plank canoe. Both divisions have a single survivor that remains in active use. The differences between types are connected with size, involving the number of outrigger booms and whether the canoe was used for sailing in addition to paddling. Sailing involves the addition of supports for the sail, bow and stern covers, and a projecting balancing boom on the side opposite the outrigger.

DUGOUT CANOES

1. Paopao. The smallest dugout, with two outrigger booms, propelled by paddling.

2. Soatau. A medium dugout, with three outrigger booms, propelled by paddling.

3. 'Iatolima. The largest of the dugouts, with five outrigger booms, topsides, bow and stern covers, and sail.

PLANK CANOES

4. Va'a alo. The bonito boat made of lashed planks, with two outrigger booms connected with float, propelled by paddling.

5. Amatasi. A plank canoe larger than the bonito boat, with two outrigger booms connected with the float, a platform over the booms, balancing spars on the right, and a mast for sailing.

6. Taumualua. A wide plank canoe without outrigger, modelled originally on whaleboat lines, idea foreign but technique native.

7. 'Alia. The double voyaging canoe made of planks and consisting of two canoes lashed together.

All have top sides and bow and stern covers.

Outriggers are always on the left side. They consist of a float, cross booms, connecting pegs, and a connecting lashing. The float (*ama*) is a large spar of light wood set parallel with the canoe at a little distance and floats on the surface of the water to give the narrow canoe a wider support on the water. The outrigger booms (*'iato*) are lashed to both gunwales or upper edges of the sides of the canoe and project out to the left over the float. Being straight they are connected with the float by an indirect attachment of connecting pegs (*tu'itu'i*) and a lashing of braid (*li*) which extend between booms and float.

The *'alia* voyaging canoe disappeared as foreign transport afforded an easier way of getting to the various islands in the group. Its disappearance was hurried by the coming in of the *taumualua* as far back as 1849, though the *'alia* survived for some time after that. The *taumualua* was created from a foreign model and made wide enough with sennit-sewn planks to dispense with the outrigger float. It was much used in military operations to convey armed troops, and its sides could be barricaded to protect it from gun fire from the shore. It was paddled after the Samoan fashion with the paddlers facing the bow and propelling it like an ordinary canoe. As inter-district wars died down, the *taumualua* in turn gave way before the *fautasi*, a boat built purely for transport in the form of a large whaleboat with planks nailed together and rowed with oars resting in rowlocks. The *fautasi* in turn are rotting in their boat sheds, as the desire for speed and less labor has reached

the Samoan and he prefers to travel by the interisland steamers and motor boats that are now becoming more and more available. The *fautasi* are also community boats which require large crews. They are unsuited to the needs of the few. Governments have also extinguished any flickering remains of the Polynesian voyaging spirit by prohibiting travelling in boats between distant islands owing to the danger. In this way, the descendants of one seafaring race is protecting the descendants of another from the element that made their ancestors famous.

The *'iatolima* and *amatasi* are no longer seen but an odd *soatau* still survives as an interesting relic of the past. The Samoans have reduced the canoe building craft to a minimum. Only such craft as have a material advantage which cannot be otherwise supplied are made. The types still made have therefore dwindled down to two, the *va'a alo* (bonito boat) and the *paopao* (dugout). The bonito still swims in Samoan waters and no easier method of securing them has been devised than the pearl shell hook trolled in the wake of a fast-paddled plank canoe. Even now change is taking place for more and more bonito canoes are being made of dugouts. It only remains for a cheap kind of oil engine to be put on the Samoan native market and the lingering type of plank canoe may join its contemporaries. The *paopao* is a necessity which cannot be discarded. So long as the people obtain an important part of their food supply from the lagoon, so long must every family have some kind of vessel to assist in obtaining it. The *paopao* is light, easy to manage, and not expensive in building. The complex of the hollowed log, the outrigger float, and the direct paddle is so inground in the methods of the people that the *paopao* is assured of existence for many years to come.

THE SMALL DUGOUT CANOE

The *paopao* dugout is in active general use throughout the group for fishing or transport inside the reef and is an indispensible part of every male adult's equipment in life. In fine weather, they are used in *alafanga* fishing with the *paala* hook trolled from a line outside the reef. (See Pl. XXXVIII, *A*.)

The timber for the hull is *papaongo, pipi, fau, 'ulu, tamanu,* and *mosooi.* A tree with a trunk of suitable size is selected in the forest, cut down and roughly shaped to lessen the weight. The stern end is invariably shaped to a knob with a constricted neck. Around the neck, a rope is tied with which to haul it to the village. While at Tau, a roughly shaped hull of *tamanu* was floated round from the village of Amouli, a few miles away. Two men accompanied it, without a canoe, but simply swimming beside it and propelling it in that manner outside the reef. Opposite the channel at Tau, one of them swam in with the end of the rope which was tied to the constricted neck described. The villagers went down and assisted in hauling it in by the rope

as there is an outward set through the channel which the primitive method of propulsion used could not overcome.

The hull was subsequently dubbed out at Tau with short-handled steel adzes. After the outside of hull, bow, and stern had been shaped, the hold (*liu*) was hollowed out. The process of hollowing out the solid trunk in one piece (*fu'e fua*) is in contradistinction to hollowing out the inner side of the planks of a plank canoe (*fufu'e*). The shape and the amount hollowed out is guided by experience. When hollowing the hold, the carpenter often taps the side of the hull with his knuckles to judge by the sound if more wood should be removed. He hollows down until by percussion he gets the normal note of the required thickness. The shape of the hull of a Savaii *paopao* is shown in figure 219.

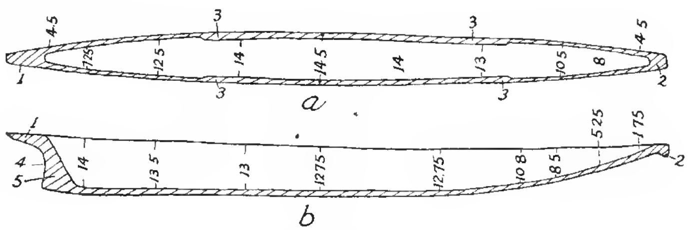


FIGURE 219.—*Paopao* canoe, 16 feet, 8 inches in length: *a*, width between outer edges in inches; the projecting part of the bow (1) is 12 inches long and the similar part of the stern (2) much shorter. The width of 4.5 inches at either end gradually increases to 14.5 inches in the middle. The upper edge on either side has an inside thicker flange (3) for the middle 7.5 feet. The inside flange to strengthen the upper edge for the support of outrigger booms lashed through holes made below the flange, is a constant feature. *b*, Longitudinal section through middle line, showing inside depth of the hold. The shallow forward bow projection (1) running back to a bluff almost vertical descent (4) to the keel part is characteristic. The hollowing of the hold slopes back from the bow leaving a solid part (5) for resisting the waves. The bow slope meets the deepest part of the hold (14 inches). The hold slopes back to 12.75 inches in the middle and to nothing at the stern. The long upward sloping stern ends in a knob (2) with a constricted neck derived from the hauling knob on the log and retained as a characteristic feature.

In preparing the log, the removal of the wood to clear the upper edges of the canoe leaves a plane surface which is above the greatest diameter of the log. In further shaping the log, though the ends are narrowed to form the bow and stern, the middle part of the hull retains the original contour of the log. In excavating the hold, the dubbing out in the middle part thus follows to some extent the original curved circumference of the log with the result that the greatest width of the hold is below the upper edges. This is a characteristic feature of the Samoan *paopao* but naturally where the hull narrows towards the ends, the greatest width works upwards to the upper edges. The narrowing of the hold at the upper edges has been held by some writers to be so characteristic of Melanesian dugouts as to form a diagnostic point of

difference to Polynesian canoes but figure 220 illustrates that the narrowing is due to the use of small logs which affects the technique of both races.

The solid parts of the bow and stern that project beyond the edge of the hold vary in length. In a Tutuilan canoe 15 feet long, the solid bow was 17 inches in length and the stern 7.5 inches. In some canoes, the upper surface of the solid bow and stern parts were in the same plane as the upper edges of the sides, while in others the edges were cut down at a slight slope fore and aft to place the canoe edges at a lower plane.

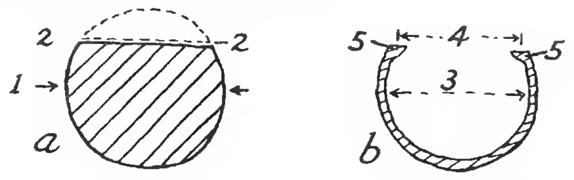


FIGURE 220.—Cross sections of log and canoe hull: *a*, cross section of log, showing greatest diameter (1) below the surface (2) adzed off to form upper edges of the canoe; *b*, section through middle of a Tutuila canoe, 15 feet long, with inside depth in middle of 11.5 inches; the greatest width (3) corresponds to the greatest diameter of the log and is 4 inches greater than that at the upper edges (4); the inside flanges (5) are also shown.

Many of the Savaii canoes were ornamented with rectangular knobs projecting upwards in the mesial line at the bow and stern. Additional ornamentation was formed by cutting nicks in the upper edges on the inner side of the solid bow and stern parts. (See fig. 221.)

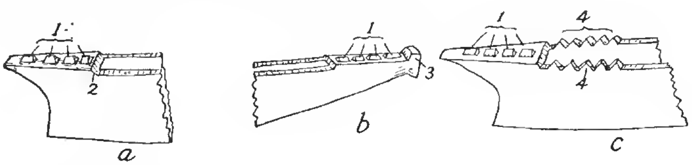


FIGURE 221.—*Paopao* canoe ornamentation: *a* and *b*, raised knobs; *c*, serrated edge: *a*, upper surface of bow, 8 inches long, four knobs (1) in middle line, each not quite 2 inches long, 1 inch wide, 0.75 high, four-sided with inward slope forming smaller upper surface. Note downward slope (2) from bow piece to upper edge of side. *b*, Stern of same canoe as (*a*), length of stern upper surface, 9 inches, four rectangular knobs (1) in middle line, raised stern hauling knob (3) 3.25 inches wide and 3.25 inches deep. *c*, Bow with four knobs (1) in mesial line of bow, raised serrations (4) behind bow formed by leaving the upper edges a little raised and cutting "V"-shaped nicks.

The occasional knob ornamentation of *paopao* canoes follows the orthodox treatment of bonito canoes in which the knobs form stands for *pule* shells. As such shells were not easily obtained in Samoa, it is improbable that they were used in the *paopao* canoe.

Topsides. The typical dugout *paopao* has no added topsides (gunwale) or *oa*. In Leone and other parts, however, topsides 2 inches deep had been

added but the method is not characteristic. There is nothing, however, to bind a carpenter down to a set rule. If he feels that topsides would improve his canoe, he simply adds them in the manner to be described on page 390.

As the canoe is for use within the calm lagoon, bow and stern covers to roof over parts of the hold and prevent waves breaking in are not necessary and consequently are not used.

The outrigger. The outrigger structure consists of two cross booms (*'iato*), a float (*ama*), and connecting pegs (*tu'itu'i*). (See Pl. XXXVIII, *A*.)

The booms. These are preferably of *milo* wood. In the 15-foot *paopao* from Leone the fore boom was 4 feet, 6 inches long and the aft boom an inch longer. The aft boom was lashed across the gunwales 2 feet 9 inches from the commencement of the hold at the stern, and the fore boom, 3 feet 9 inches from the bow commencement of the hold. There was thus 6 feet 5 inches between the two booms.

In the typical *paopao* single fair-sized holes are bored through the sides of the canoe just below the inside upper flange, or about an inch below the edge and directly below the booms. The method of lashing is described on page 393.

The float. This is made of *fau* and is 10 feet 6.5 inches long, sharpened at the fore end and cut off square an inch behind the aft peg connections of the aft boom. The vertical distance between the upper surface of the float and the under surface of the fore boom was 12 inches and between float and aft boom 7 inches. The float was selected from a pole of appropriate size and usually receives no trimming except at the pointed fore end. In this particular canoe two flat upper side surfaces were trimmed to form a mesial upper ridge between them. The float was approximately parallel with the middle line of the canoe.

The above measurements give an approximate idea of the canoe for comparative purposes. As will be seen in describing the more elaborate bonito canoe, measurements were not made beforehand, but the set of the outrigger was judged by eye and after lashing the parts together the superfluous ends were cut off.

The connecting pegs. These are of two types; separate pegs, and the branched boom. Separate pegs consist of two pairs to each boom. They are made of ironwood rods a little over half an inch thick. The inner pair are connected with the float by pointed ends stuck into holes on the upper surface of the float to the canoe side of the middle line of its long axis. The upper ends incline inwards, one on either side of the boom to which they are lashed. The outer pair are fixed similarly below to the outer side of the middle line of the float, and above they incline outwards to embrace the boom to which they are lashed together. Below, the two sets of holes are between 1 and 2 inches apart across the middle line. The individual members of each pair are

roughly about the same distance apart on the float as they are on the boom; namely, something between 2 and 2.5 inches. They may be a little wider apart below but it is characteristic of this type to have lower ends of the same pair not widely diverged on the float. The holes in the float are about an inch deep.

The booms are perfectly straight so the connecting pegs fill the distance between the booms and the level at which the float is placed. In most of the *paopao* examined for this feature, the outer pair of connecting pegs are longer than the inner pair on the same boom. This is not so noticeable with the aft boom, where the distance between the boom and the float is shorter. Thus in the *paopao* from Tutuila, with an aft vertical depth of 8 inches between boom and float, the outer pair of pegs was 15 inches long, and the inner 14 inches, a difference of only one inch. With the foreboom, however, where the vertical depth between boom and float was 14.5 inches, the outer pair of pegs was 22 inches long as against the 18 inches of the inner pair—a difference of 4 inches. In the bonito canoe, as we shall see, the inner and outer pairs are usually of the same length, so the difference in the common *paopao* may be due to less careful work. As stated, the relative position between float and boom is decided without the pegs. The pegs are afterwards lashed on to maintain the relative position, and one craftsman may merely place them against the boom and lash them in position without considering the other pair; another craftsman, after fixing the inner pair, may measure the outer pair by laying them against the inner pair and so arrive at equal lengths and equal angles. The relation of the upper ends of the outer pair of pegs to the outer end of the boom does not come into consideration. There is no fixed outer end to the boom until the upper ends of the outer pair are lashed to the boom. The outer part of the boom is then cut off 4 inches to the outer side of the lashing. This, however, may be after technique due to sharper tools.

The complementary lashing. The peg type of connection keeps the float off at the proper distance but, owing to the insecure connection below, something is needed to keep boom and float from coming apart. This additional connection, by lashing with braid, is complementary to the peg connection. It is easy to pass turns of braid vertically round both boom and float but if the turns are taken under the float, they will be subjected to much wear and tear, as the canoe is dragged up on the reef or shallow parts within the lagoon. In the *paopao* canoe, therefore, the braid lashing must not pass under the float. To obviate this, a transverse hole is bored through under the median ridge on the upper surface of the float. This is the reason for shaping the upper surface of a *paopao* float. If it is not shaped, then a hole must be bored downwards and inwards on either side of the middle line to meet. Through the hole, a number of turns of braid are passed which loop over the boom, the hole being directly under the boom. After sufficient turns, transverse turns

are taken round the descending and ascending limbs of the lashing and knotted. The lashing, which is called *li,* thus keeps the float attached to the boom and by passing through a hole through the upper surface of the float, is saved from wear on its under surface. The details of lashing the pegs to the boom are described on page 398.

The branched boom. This is of *milo* selected with a small branch of the right size to form a connecting peg. The lower end of the branch is sharpened and inserted firmly in a hole made in the upper surface of the float. An example was seen at Tutuila but the presence of a complementary braid lashing was overlooked. In the Cook Islands, a similar type of boom connection prevails, but complementary braid lashings are always used with it. The branched boom was not noticed outside of Tutuila.

The seat. The *paopao* is a one-man canoe. A seat (*nofoanga*) about 6 inches wide is dubbed out of any convenient wood and the outer ends usually cut away on the under surface to fit over the gunwale of the canoe and so lock it into position. When a man hauls up his canoe, he usually picks up the seat and carries it into his house together with his paddle. The position of the seat is in front of the aft boom. The canoe will of course hold two in an emergency, but the gunwale edge comes down to the water line. For more than one the larger *soatau* dugout was made. A longitudinal pole is sometimes tied to both booms towards their outer ends.

The float is deeper forward in construction, but when the canoe is in the water with the weight of the occupant more astern, the aft part of the canoe sinks down and the float is then level in the water as the bow part of the hull is further out of the water.

The outline of the hull in a well made canoe is regular. Most *paopao* not so regular, may look very badly made as the side edges are often twisted to one side or the other. Much of this irregularity may depend on the timber, or on the individual craftsmen. The *paopao* canoes are made by the householders who are not expert carpenters. A master builder while enumerating the canoes made by the carpenters' guild omitted the *paopao.* On my mentioning it, he smiled and said, "The *paopao* is not a canoe." Neither is it from the expert point of view. In the eyes of the guild they rank with the cooking houses and are beneath their dignity to build. Hence, unskilled labor gets employment to its own content for no one would pay the price of skilled labor for either *paopao* or cooking house.

Rod rests. In Savaii, a good deal of rod fishing for smaller fish takes place inside the reef. A forked rest is lashed to the fore boom together with a connecting peg to carry the far end of the rod while the butt end rests on the aft boom. A feature of these rests was that the fork was much higher than the bonito rod rest, one measured with a double fork having the forks 20 and 29 inches respectively above the boom.

THE MEDIUM DUGOUT CANOE

The *soatau* is hollowed out of a longer section of tree trunk than the *paopao,* and is provided with a longer float and an extra outrigger boom. Topsides, bow and stern covers are not added. The general lines of the bow are similar to the *paopao* but the stern is wider and cut square across without the hauling knob characteristic of the *paopao.* A full sized *paopao* figured by Kramer (18, vol. 2, p. 246) features the square stern and also the divergence of the connecting pegs towards the float. (See fig. 222.)

FIGURE 222.—*Soatau* dugout canoe, stern end: 1, square stern, no hauling knob; 2, aft boom; 3, two pairs connecting pegs, widely divergent lower ends, upper ends crossed over boom; 4, longitudinal pole lashed to booms to inner side of connecting peg lashings (after Kramer).

A model in Bishop Museum (Pl. XXXVIII, *B*), shows a more sloping stern but the divergence of the lower ends of the connecting pegs is present. The connecting pegs are in two pairs but their lower ends are more widely apart in the long axis of the float than they are in the *paopao.* The upper edges of the sides are provided with inner flanges under which the lashings of the straight booms pass. The float is cut off square close behind the aft connecting pegs, while the fore end reaches the level of the bow. Longitudinal poles are attached to the outer ends of the booms close to the lashings of the connecting pegs. A complimentary lashing to the connecting pegs was also used. The only *soatau* seen was at Upolu.

THE LARGE DUGOUT CANOE

The *'iatolima* (*'iato,* outrigger boom; *lima,* five) receives its distinctive name from having five outrigger booms. It is an advance on the *soatau* in size with additional booms and being sailed, it usually has additional depth provided by topsides and protection from an inrush of water by bow and stern covers. A *suati* balancing spar also projected from the right side of the canoe.

No *'iatolima* was seen, but Kramer (18, vol. 2, p. 248) figures a model of a *soatau* which is rigged as a *'iatolima,* including the sail. The hull is undoubtedly a *soatau* dugout with finer lines at the bow and stern. The upper edges have wide inner flanges and there are no topsides, or bow or stern covers which my informants stated were characteristic of the *'iatolima.* On the other hand, there are five outrigger booms; a forward pair, a middle pair, and an aft single. Each boom has its own set of two pairs of connecting

pegs not diverged below so much as in the *soatau*. The float is cut off short behind the aft connecting peg. Two longitudinal poles are lashed to the booms above the connecting peg lashings. The *suati* balancing spar is present. The characteristic features of the rig of the *'iatolima* may be followed out in figure 223, taken from Kramer.

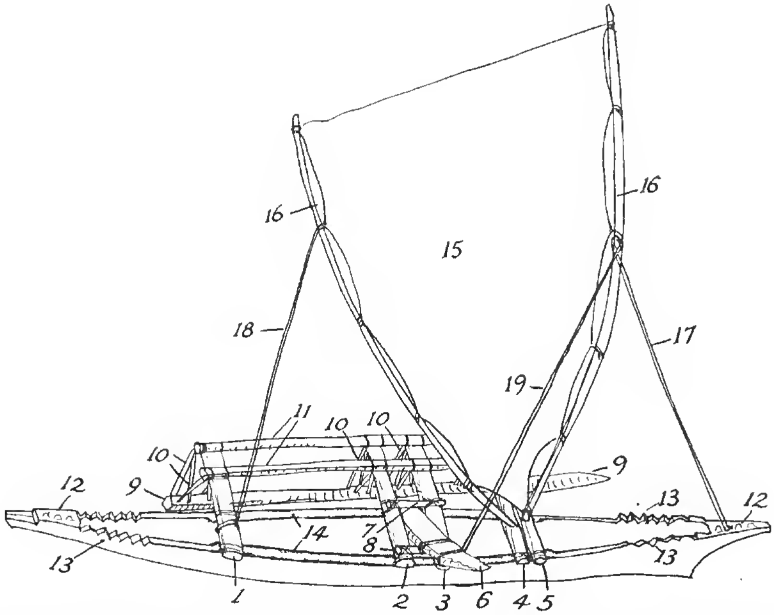


FIGURE 223.—Five-boom, *'iatolima* dugout: 1, aft single boom; 2, 3, middle pair of booms spaced sufficiently to allow balancing spar to be placed between; 4, 5, forward pair of booms close together; 6, *suati* balancing spar with inner end passing under cross piece (7) and above a second cross piece (8); 9, float; 10, connecting pegs in pairs; 11, two longitudinal poles; 12, knob ornamentation; 13, serrated edge ornamentation; 14, wide inner flange of upper edges; 15, sail; 16, spars supporting sail; 17, fore stay from fore spar to bow; 18, aft stay from aft spar to aft boom; 19, right side stay from fore spar to balancing spar; stay on other side to one of the outrigger booms concealed by sail.

The significance of the five booms can now be followed. Three booms would have been quite enough if the canoe had been propelled by paddles alone, but the use of a sail necessitated special provision for a balancing spar and the support of the sail spars. The balancing spar was provided for by placing two booms close together in the middle with enough space for the spar between them. A cross piece was lashed above the booms over the left edge of the canoe and another similar cross piece was lashed above the right edge of the canoe. The inner end of the spar was placed under the left cross piece and as it projected out over the right side it rested on the second cross piece to which it was lashed. The forward pair of booms were placed closed together to give support to the lower ends of the spars supporting the sail.

The triangular sail, with the apex down, was lashed on two sides to fore and aft spars the former of which was kept vertical by three rope stays; one to the solid bow piece, one on the right to the balancing spar, and one on the left to one of the projecing outrigger booms. The aft sail spar was stayed to the single aft boom and could be manipulated as required. In sailing with the wind on the right, any heeling over that would submerge the float to the verge of capsizing the craft was remedied by putting weight on the balancing spar. With the wind from the left any heeling over that brought the outrigger float too much out of the water was met by leaning out on the outrigger booms.

The *'iatolima* has the distinction of being the only dugout that was sailed and it received its name from the special technique of providing five booms to enable a *soatau* hull to be sailed. The provision of topsides, and bow and stern covers are improvements to a craft that sails out beyond the reef.

Before passing on to plank canoes, it may be stated that dugout bonito canoes are now being made quite extensively in Savaii. The hull is hollowed out of a single log but the lines and finish follow those of the plank canoe.

PLANK CANOES

THE BONITO PLANK CANOE

The bonito canoe (*va'a alo*) was built for speed so as to keep up with the schools of fish being pursued by the bonito. To obtain speed, the hull had to be made as light as possible. The size of the canoe was no problem as trees larger than the canoe were readily obtainable and were used in the *soatau* and *'iatolima* types. To get the hull thin enough, it was easier to control the thinness of the material by dubbing out short sections of planks than by excavating the whole hull in one piece. Of later years, better control over a one-piece hull has been obtained with the sharper steel adzes, and has led to the manufacture of dugout bonito canoes. Before the advent of steel adzes, however, the technique of the plank bonito canoe had become established and many craftsmen despise the dugout bonito canoe as not being true to type. The manufacture of the plank canoe came within the field of the guild of expert carpenters. The canoe is made in the old style except for the use of steel adzes.

Besides timbers and adzes, a good supply of sennit braid is needed for the lashings. The braid is made up into working hanks which in canoe building are distinguished by the term *tanganga* instead of being called *i'o fanga* as in house building. A length of braid is used for measuring. For marking the wood, a piece of charcoal, or some chacoal mixed with water in a half coconut shell with a piece of coconut leaflet midrib, are needed. For fitting the planks, red earth is mixed in another half coconut shell and a section of coconut husk (*pulu*) is used as a brush. A coconut leaf to supply leaflet midribs to serve as needles, and some bits of wood to form wedges are also on hand. Holes are

now bored with a bit and brace but in olden times, the *foafoa* (*Terebra*) shell with its spiral whorls running to a point was used as a drill or gimlet.

The canoe hull was built in a canoe shed (*afolau*) or in an unoccupied dwelling house.

The hull. The plank hull consists of separate sections of which the keel, bow piece and stern piece are single elements sharing in the construction of both sides. The other separate pieces of plank (*laufono* or *lauva'a*) are arranged in two tiers (*taloa*) of which the lowest, consisting usually of five pieces, is termed the *laulalo* (bottom tier), and the upper the *laulua* (second tier). The vertical or oblique joins between individual pieces are termed *tautu* while the horizontal joins between tiers is distinguished as *aufono*. The arrangement of pieces in the hull is shown in figure 224.

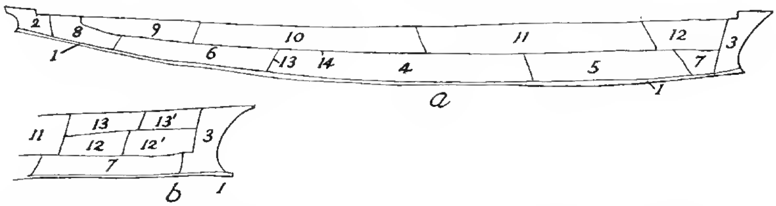


FIGURE 224.—Bonito canoe (*va'a alo*) plank sections: *a*, plank sections of one complete side; 1, keel (*ta'ele*); 2, stern piece (*taumuli*); 3, bow piece (*pale*); 4, 5, 6, 7, 8, form the lower tier (*laulalo*)—4, *tumatua* middle piece with wider lower edge and ends running obliquely upwards and inwards; 5, and 6, *tatao o le tumatua*, they press (*tatao*) against the *tumatua* on either side; 7, *angai o le pale* (companion of the bowpiece); 8, *angai o le taumuli* (companion of the stern piece); 9, 10, 11, and 12, four pieces forming the second *laulua* tier, without specific names; 13, a join between sections (*tautu*); 14, a join between tiers (*aufono*); *b*, section of smaller pieces which corresponds to the usual section (12 in *a*) is made up of smaller sections (12, 12', and 13, 13').

The five sections of the lower tier have been given individual names by the carpenters as they have to be very carefully shaped and fitted to form the foundation lines of the canoe and are often referred to during work. The four sections of the upper tier have no individual names but are referred to as *ola o le laulua* (sections of the second tier).

A flaw in an otherwise good piece of timber was met by cutting out the flaw and putting in a patch rather than to waste material. Such patches (*fa'asosolo*) are often seen in perfectly good canoes and their presence does not depreciate the value of the canoe. Canoe builders were masters of shaping, fitting, and lashing, and though they had a general rule as to the number of sections to be used in each tier, they had no hesitation in altering details to make the available material suit their purpose.

The keel. After assembling the material, work commenced with shaping and setting up the keel (*ta'ele*). Bonito plank canoes were seen in various stages of construction throughout the group but the actual setting up of a keel

was seen in Leone. The master builder remarked that I had come to the right place as the knowledge of building bonito canoes had been derived from Uamea and Poeausi, both builders and head fishermen of Leone.

The keel is made in one piece of *ifilele* or *talie* wood and may be simple or compound in form.

The simple keel in the Tau canoe (Pl. XXXVIII, *C*) is 23 feet 5 inches in length and ranges in width from 1.3 inches near the pointed ends to 4.5 inches in the middle, while the greatest depth is 2.5 inches. The greatest width is that of the convex under surface which is exposed throughout its length. At either end, the keel is triangular in section, the two inclined sides meeting in a median ridge. As the keel widens out, a grooved upper surface is dubbed out in such a way as to provide flanges for the lashing technique. For details see figure 225.

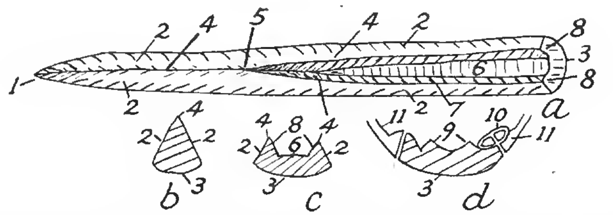


FIGURE 225.—Bonito canoe with simple keel, 23 feet 5 inches long: *a*, stern end of keel from above; 1, pointed end; 2, sides inclined to meet in upper median ridge (4), lower convex surface seen in end section (3), the solid triangular part is 5 inches long at the bow, and 12 inches at the stern; 5, point 12 inches from stern point (1) where, owing to the widening of the keel, the median upper ridge opens out gradually into the upper surface (6). The sides (2) and the curved bottom (3) continue in their relative positions. The upper surface is dubbed out to a lower level than the upper edges of the sides to form flanges. *b*, Section of solid triangular part near ends, showing lower convex surface (3) which forms the exposed part of the keel, the two inclined sides (2) which fit against the stern piece, and the upper median ridge (4). The width of the solid part is 1.3 inches. *c*, Cross sections of keel in middle. The keel has widened out to 4.5 inches, the wider convex bottom (3) and the sides (2) occupy the same relative position, the sections of the lower tier will fit against the sides, the upper surface (6) has widened out to 2.3 inches and is at a lower level than the upper edges (4) of the sides. From the upper edges of the sides, the keel is cut downwards and inwards on the inner sides to meet the upper surface and thus forms flanges (8) which will subsequently be pierced with holes to take the lashing of the sections to the keel. *d*, Section of keel through two raised ridges (9) to inner side of lashing flanges, to protect lashings (10) which pass through keel flanges and flanges of side pieces (11).

In some canoes two raised longitudinal ridges are left on the upper surface close to the inner side of the lashing flanges. (See fig. 225, *d*.) They are situated in front of where the aft boom will cross and are called *tali tata* (*tali* to receive; *tata*, bailer). The ridges are long and protect the lashings as the bailer is scooped along the bottom.

The compound keel has the complete stern piece cut out of the solid with the keel, and also raised portions at the bow end (fig. 226). This form of

keel obviates the complicated technique of attaching a separate stern piece to the triangular part of the keel, while the attachment of the bow piece is also simplified. The compound stern piece is termed *fa'autouto*. Keels vary in dimensions, one seen in Tutuila being 7 inches wide in the middle and 5 inches towards the bow. The keel, having been dubbed out and shaped, is set up in a shed or house as shown in figure 226.

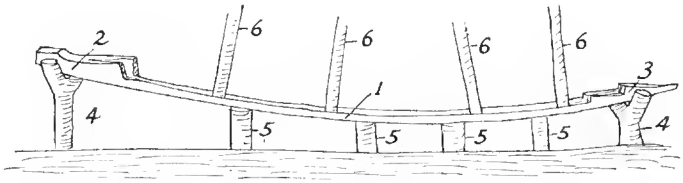


FIGURE 226.—Setting up the keel of a bonito canoe. The long slender keel (1) with the compound *fa'autouto* stern piece (2) and the compound bow part (3) to receive the bow piece, is laid with the two ends resting in forks of special stakes (4) set firmly in the ground. Four graduated stakes without forks (5) are spaced under the keel and adjusted to give the keel the required curve. Another set of longer stakes (6) resting on the grooved upper surface of the keel, are forced down to keep the keel against the under props and their upper ends are tied to the roof framework of the house. The keel having been forced into the correct curve, is kept in that position by the upper and lower series of stakes acting as a vise.

The individual sections are shaped and fitted to the keel, the order being the stern piece, bow piece, and the five sections of the lower tier.

The stern piece. The separate stern piece (*taumuli*) has two main features in construction; the narrow part aft is solid with a groove cut on the under surface to fit the solid triangular part of the keel, and the forward part is hollowed out to form thin sides. When the lower, and upper sides are freed by hollowing out, these edges have to be provided with inner raised flanges which are necessary for the lashing technique. The right edges have also to be provided with flanges for lashing to the next plank section. The compound keel requires no preparation for attaching to the keel but it has to be hollowed out and flanges provided at the free upper and front edges. In shape the compound stern piece follows more on the lines of the *paopao* dugout. For details regarding both forms of sternpiece, see figure 227.

The bow piece. The bow part is generally referred to as the *taumua* but the actual bow piece is termed *pale* in Manua and *la'ei* in Tutuila, while both places refer the term *taumua* to the bow cover. Where the term *taumua* is applied to the bow piece, the bow cover is distinguished simply as *tau*.

The bow piece is dubbed out of the solid, the forward narrow part remaining solid while the aft part as it widens out, is hollowed out to form the two diverging sides. It runs the full depth of the deep bow and is hence attached to both sections in both tiers. See figure 228.

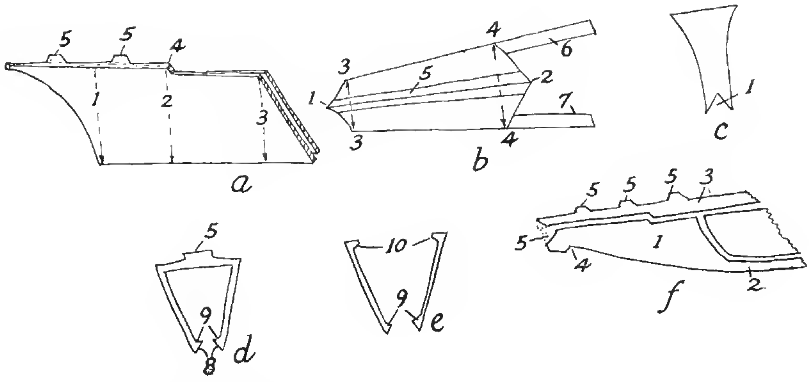


FIGURE 227.—Stern piece section of a bonito canoe: *a*, right side; left edge showing curved line of the stern; lower edge, straight and fitted against the keel; right edge straight, oblique downwards and forwards, fitting against the section called "companion of the stern piece"; upper edge runs straight for 10.5 inches and then cuts down at a slant (4) to a lower level of an inch and continued on for 5.75 inches. The depth at (1) is 6.4 inches; at (2), 6.25 inches; and at (3), 6.25 inches. The projection formed by the upper and left edges is characteristic and in some canoes may be more pronounced. The ornamental knobs (5) from the upper surface show up. As far as the line (2) the stern piece is solid, but to the front of the line it is hollowed out; the sides incline upwards and outwards from the keel, the outward inclination increasing to the right. *b*, Upper surface projects backward in the middle line to a point (1) and forwards to a point (2), the distance between them being 13.5 inches; the aft width at (3) is 3.3 inches and at (4) it is 5.1 inches; the side edges between (3 and 4) are both 10.5 inches long. A raised ridge (5) is left in the middle line to be subsequently trimmed into knobs; up to the right edge (4, 2, 4) of the surface, the stern piece is solid above, but below and beyond that it is hollowed out to leave the two sides (6, 7) at their normal thickness; the upper edges of the sides are on a plane an inch lower than the solid upper surface; the left side (6) is 6.75 inches long, an inch more than the right side (7). *c*, Cross section at line (1 in *a*). The section is through the solid part on the extreme left of the lower edge. The upper surface is 4.2 inches wide. The sides curve in and descend to the narrow width of 1.3 inches which corresponds to the width of the keel in this part. The lower end is cut in a "V"-shaped groove (1) which fits over the two inclined sides of the keel; the vertical depth in the middle line to the top of the groove is 5.5 inches. *d*, Cross section at line (2) in (*a*). The hollowing out below the upper surface defines the sides. The upper surface is 5.1 inches wide and the mesial ridge (5) is evident. The lower ends of the sides have diverged to 2.2 inches and the edges (8) are cut at an inclined plane to fit against the sides of the keel and increased in thickness to form flanges (9) on the inner side for lashing against the flanges of the keel; *e*, cross section at line (3) in (*a*); the two sides have no connection above as well as below; the lower edges have diverged with the increasing width feature; above, the divergence has increased to carry on the expanding lines of the canoe. On the inner side of the upper edges, flanges (10) are formed for lashing to the stern cover. The sides are from 0.25 to 0.5 inches in thickness, while the raised flanges are 1.25 inches thick. *f*, Stern piece of compound keel. The stern piece (1) and the keel (2) are in one piece; the stern cover (3) shows that it passes over the stern piece to the end and thus carries the mesial line of raised knobs (5); the end of the stern is marked by the constriction (4) characteristic of the hauling knob of the *paopao* dugout. If the stern end and the stern cover fit square as at the dotted lines (5), the true *fa'autouto* name of the stern piece is retained, but if both are cut away to form a notch as shown, the part is termed *fa'afululupe,* a term also applied to the notch cut in wall posts.

Keel fitting. It is most important that the lower edges and lower surfaces of all pieces and sections should fit exactly against the sides of the keel. Exact fittings are made by using the mixture of red volcanic earth (*elele*) which must not be confounded with the special red earth (*'ele*) used in dyeing bark cloth. The mixture with water is termed *sama,* the husk brush becomes *au sama,* and the process of marking the boards is termed *ango.* The mixture is applied to the narrow side surfaces of the keel and the stern piece fitted over it to take the impression of the wet *sama.* The parts marked on the stern piece are carefully chipped off and by repeated trials the fit is made perfect. The same procedure applies to the bow piece and all plank sections.

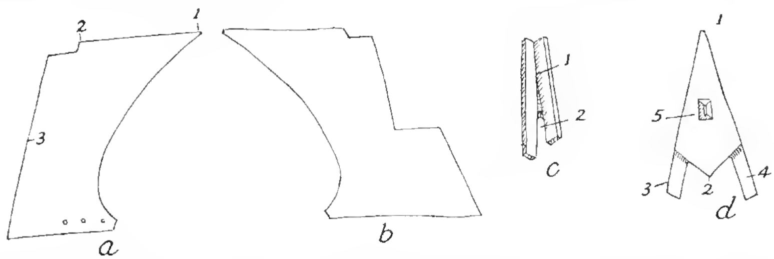


FIGURE 228.—Bow piece section, bonito canoe: *a*, right side, right edge shows curved line of cutwater which projects forward below. The lower edge for lashing to the keel is 8 inches in length; the upper edge is 8.1 inches long from the projecting sharp bow (1) to the point (2) where it is cut down to a lower level for 1.4 inches. The aft edge is straight, oblique downwards and backwards, and 2 feet 7.5 inches in length. The width at the point (3) which marks the line below to two tiers, is 4.7 inches. *b*, Left side. Cutwater line is on left. The aft edge (right) shows a projection back of lower part to fit against the bottom tier with the consequence that the lower edge is 1.25 inches longer than on the other side. *c*, Under surface showing "V"-shaped groove (1) to fit over triangular keel and the division (2) of the two sides to fit against the flanges of the keel. The difference in length of the two lower edges is seen. *d*, Upper surface showing pointed bow (1) with backward projection in middle line (2) and divergence to two hollowed-out sides; the right (4) being longer than the left (3). Knob (5) on upper surface in middle line.

Temporary lashing. In order that all end edges as well as lower edges may be exactly fitted, a commencement is made by temporarily lashing the stern piece to its place over the keel. The lashing through the solid grooved part is different to that through the flanges of the diverged lower edges. The temporary lashing is made through the flange part and the solid part is left until the permanent lashings are made. With the stern piece in position, the flanges in its fore part fit exactly with the flanges of the keel. Flanges to the inner side of all edges made for the purpose of lashing are termed *fa'aopoopo.* The first step is to bore holes through both flanges as in figure 229.

The lashings are made through the paired holes and round the flanges on the inner side so that they do not appear on the outer side of the canoe. Though the lashing is temporary, the special technique involved is also used

in the later permanent lashings. An end of the sennit braid to be used is unravelled, the plies thinned down and twisted into a finer two-ply twist which is drawn through the paired holes with a leaflet midrib. Because the leaflet needle is too frail to draw successive turns through the holes as the space becomes filled by the turns, a continuous loop is used to surmount the problem of overcrowding. (See figure 230.)

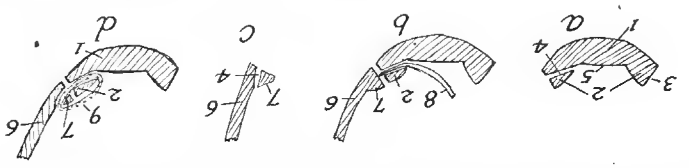


FIGURE 229.—Boring holes through flanges of keel and stern piece showing sections of keel and one side of stern piece: *a*, keel (1) showing flanges (2). The outer side surfaces of the keel (3) are fairly wide as they include the outer sides of the flanges. A point is selected somewhere about the middle of the outer surface and a hole (4) bored through to the angle made by the inner side of the flange with the upper surface (5) of the keel. *b*, The stern piece (6) placed in position, with its flange (7) fitting against the keel flange (2) and bottom curve of keel continuous with outer surface of stern piece. A leaflet midrib (8) dipped in charcoal mixture is pushed through the keel flange hole from the inside and marks a spot on the lower surface of the stern piece. The stern piece is marked through all holes on both sides. *c*, Section lower end of one side stern piece. A hole (4) is bored through from the marked spot to the angle made by the flange (7) with the inner surface of the stern piece. Holes are bored through all the spots marked on the stern piece. *d*, Sections through keel (1) and stern piece (6) fitted after boring of holes, showing how the holes coincide, allowing the braid lashing (9) to pass around the keel flange (2) and the stern piece flange (7).

The completed lashings consist of a number of transverse turns over the flanges and neither the commencement nor the ending of the lashing can be seen. In temporary lashings, the turns are not made very tight but wooden wedges (*tina*) are driven in under the lashing to make them taut. When the permanent lashings are made later, the wedges are easily driven out and the slack temporary turns of the lashing are more easily removed than if they had been made taut originally. The piece is lashed to both sides of the keel and the fitting of the bottom tier of plank sections is proceeded with.

The lower tier. The shape, position, and names of the individual sections of the lower tier have been described under figure 224. They are all made of *fau* wood dubbed out to the required individual shapes with the appropriate outer curve. Each section is 1.5 inches thick. Fitting commences with the companion of the stern piece and the *sama* mixture is used to make an exact fitting with the keel and then with the forward edge of the stern piece. For exact fitting, the section must be temoporarily lashed to the keel. The temporary lashings differ from that of the stern piece in that the lower tier sections are fitted as regards their edges but the lashing flanges have not yet been provided. For the time being slots are cut on the inner surface to coincide with the holes through the keel flange. (See figure 231.)

The other sections of the lower tier are all fitted and lashed in the same manner and last of all the bow piece. When the carpenter is satisfied with the fittings, and that the right angle with the keel has been obtained, the tem-

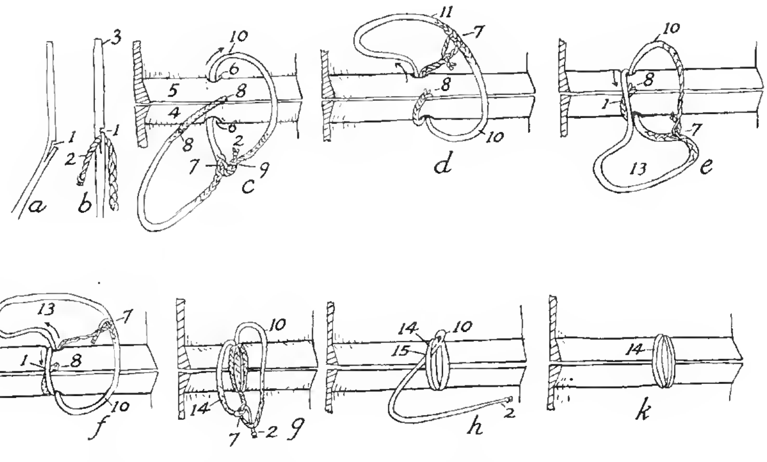


FIGURE 230.—Flange lashing with continuous loop technique: *a,* a coconut leaflet midrib is pinched through to half its thickness at (1) and the lower end split back by slightly bending it; *b,* the thin end of the braid (2) is put through the split (1) which is closed by straightening the midrib. The long end (3) is threaded through the paired hole and the braid gently drawn through. *c,* Inside view showing keel flange (4) and stern piece flange (5) fitted together with holes (6) coinciding. The midrib leaflet is discarded and the thin end of the braid (2) is passed through under one of the plies of the braid at the point (7) to form a loop. The point (7) is selected so that the length of braid between it and the end (8) is long enough to complete the lashing turns, but in the figure the length is much reduced. The thin end (2), after passing through the braid, is doubled back and passed through a ply on its standing part (9) to fix the working loop. The end of the braid (8) is crossed above the middle of the hole, held in position with the left thumb and the far side of the loop (10) is pulled to draw the slack through the hole. *d,* The end of the loop (7) has been drawn through the hole and the part of the slack beyond it (11) is pulled until all the slack is through the hole and the braid in the hole is taut against the held end (8); *e,* the taut braid is brought back over the flanges and over the short end (8) to make the first lashing turn (1) which is held down on the near flange with the left thumb. Besides the first turn, the continuous loop is also through the hole and pulling on its far end (10) will draw the loop junction (7) through the hole as well as the slack (13) which is now on the near side; *f,* both the loop junction (7) and the slack (13) have been drawn through to the far side. The first turn has been drawn taut over the end (8) which fixes the commencement of the lashing. *g,* Each succeeding turn is made by manipulating the loop in the same manner as the first turn—5 or 6 turns are sufficient to form a secure lashing. Before the last turn (14) is drawn taut, the continuous loop (10) is unfastened by withdrawing the thin end of the braid end (2) and (7). *h,* The unloosened braid end (2) is passed through under the last turn (14) which is drawn taut from the far end of the hole (10). The end of the braid (2) is drawn taut under the last turn (14) and jerked down towards the hole so that actual crossing (15) under the last turn is moved down into the hole. *k,* The end is cut off close in under the far edge of the hole. The last turn (14) fixes the end of the braid and finishes the lashing.

porary lashings are unfastened and the inner surfaces of the sections completed.

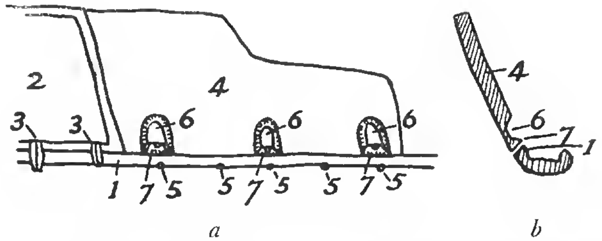


FIGURE 231.—Temporary lashing of side piece to keel: *a*, the "companion" section (4) is fitted against the left keel flange (1) and the stern piece (2) which is already temporarily lashed (3) by its completed flange. Holes (5) have been bored through the keel flange 3 inches apart. At alternate holes, the companion piece is marked with the midrib dipped in charcoal, passed through the hole in the keel flange. The section is removed and slots (6) cut in such a way that the lower parts form flanges (7) which will be opposite the marked spots. Holes are bored through from the marked spots to meet the angle of the flange and the bottom of the slot. The lashings are made by the continuous loop technique. *b*, Cross section of keel and thick section (4) showing the slot (6) with the lower flange (7) fitting against the keel flange (1).

Dubbing out the side pieces. The dubbing-out process (*fufu'e*) is to complete the flanges at all edges and reduce the remainder of the section to the permanent thickness which ranges from 0.25 to 0.5 inches. The flanges at the edges are kept at the original plank thickness of 1.5 inches or slightly less. The sections are carefully sloped in from the edges to get the inclination of the flange and the remaining material dubbed out. On the lower edges, the flange portions in the temporary slots are made continuous. In addition to the flanges, intermediate raised ribs (*fa'aau* or *iviivi*) are left at intervals to strengthen the plank. A hook projection (*fa'alave*) is also provided for. (See figure 232.)

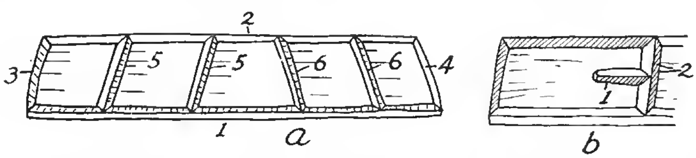


FIGURE 232.—Raised ribs of side piece with hook: *a*, inner surface of middle piece of lower tier showing completed flanges of lower edge (1), upper edge (2), and the ends (3, 4), also 4 raised ribs evenly spaced, 2 (5) inclining to the left like the end edge (3), and 2 to the right (6) like the end edge (4). The ribs are level with the raised flanges, are sloped on either side, and the intervening parts cut down to the plank thickness—the ribs are 1 foot 7 inches apart. *b*, On the left *tatao* section (fig. 224, *a*, 6), the *fa'alave* hook is made. A short horizontal rib (1) 7.5 inches long is made from the middle of a transverse raised rib (2) and the end under cut to form a hook.

After the temporary fitting of the lower tier, the expert carpenter knows exactly where the booms and seats will be. In dubbing out the pieces of the bottom tier, he leaves strengthening ribs at appropriate places to form foot

holds for the paddlers. In some canoes, extra high ribs are made by not thinning the side pieces down to the usual 1.5 or 2 inches until after the temporary fitting. The ribs being of extra height for a specific purpose were termed *tulanga vae* (*tulanga,* standing place; *vae,* feet.)

Permanent lashings are made after the side pieces have been finished off with flanges, and ribs and made as light as possible. The lashings through the flanges are a repetition of the temporary one but each turn is carefully made and pulled as taut as possible as no wedges are permitted on the finished canoe. The attachment of the solid parts of the stern and bow pieces to the triangular section of the keel created a problem that was met as shown in figure 233.

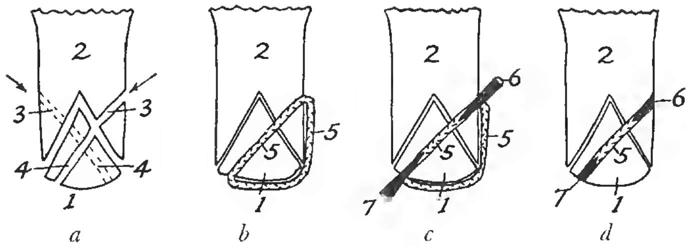


FIGURE 233.—Lashing solid parts of stern piece to keel: *a,* section of triangular keel (1) and solid stern piece (2). A hole (3) is bored through the stern piece from the outer side about 0.75 inches above the lower edge in the direction shown. Six such holes about 2 inches apart are bored through the solid 12-inch length of the stern piece. A similar set of holes are bored through on the other side, arranged to be in the intervals facing the first set. The stern piece is fitted over the keel which is marked with a blackened midrib inserted through the stern piece holes. Holes (4) are drilled in the keel from the points marked on the sides in the direction shown. The two sets of holes come out on opposite sides to the middle line of the under surface of the keel. *b,* The stern piece is again fitted and a piece of braid run through the continuous hole between stern piece and keel with a midrib needle. The continuous loop method is used and the lashing turns (5) firmly made to draw the two pieces together. *c,* A pointed stick (6) of hard wood is driven into the stern piece hole to jam the lashing turns against the side of the hole and act as a wedge. A similar wedge (7) is driven into the hole in the keel. *d,* The lashing being secured by the wedges, their ends are cut off and the external parts of the braid, being unnecessary, are cut off also. All the holes in the stern piece are so treated. The bow piece solid part is lashed in a similar way.

The lashing of the solid parts of the bow and stern pieces to the simple keel involves a distinct technique. It is probable that the compound keel which avoided the above problem is the older technique.

Before the pieces and sections are permanently fixed, heated breadfruit gum is smeared over the joining surface of the keel and acts as caulking. The best gum is obtained from the varieties of breadfruit known as *puou* and *'ulu uvea.*

The lashing of the end edges is exactly similar to the lashing with the keel flange.

The second tier. The four sections of the second tier (*laulua*) are shaped, fitted, and lashed in the same way as those of the lower layer. The upper edges of the lower tier being fixed, the red earth mixture is painted over them and the upper sections trimmed accordingly. Care is exercised in getting the proper outward inclination to form the lines of the canoe. The planks of the second tier are wider than those of the lower and bring the canoe up to full depth except for the top sides and the bow and stern covers. When the second tier is temporarily lashed, the long upper line is marked from end to end with charcoal and the upper edge of each section trimmed accordingly when the temporary lashings are unfastened. After the permanent lashings of the second tier, the canoe hull is finished off with the top sides and covers at the bow and stern.

The gunwale. In the type canoe being described, the 12-foot gunwale (*oa*) covers the middle part of the upper edge while the remaining parts are filled in by the bow and stern covers. The gunwale adds another 2 inches to the depth of the canoe. The shape in section and method of attachment is shown in figure 234.

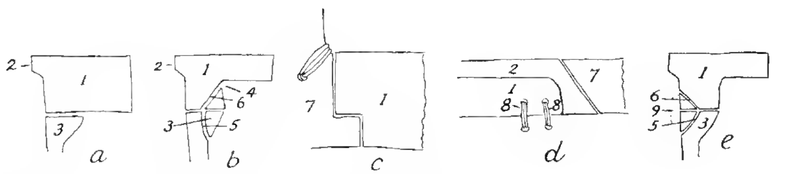


FIGURE 234.—Lashing gunwale (*oa*) to side: *a*, section of gunwale (1) which is formed from a piece of timber 3.5 inches wide and 2 inches thick. The upper surface maintains the width of 3.5 inches throughout. The outer surface is cut in from a line 0.6 inches below the upper edge at a slant for 0.3 inches, and the part below removed for that thickness, thus leaving a raised rim (2) at the upper edge. At either end the gunwale is solid as shown in the section for a few inches. The gunwale rests on the flanged upper end (3) of the sections of the upper tier. *b*, Section of gunwale (1) a few inches in from the ends; the lower surface is cut upwards and slightly outwards, reducing its width to 1.3 inches so as to fit on the flange (3) below without overlap. The inner surface is cut in horizontally from a line about an inch below the upper edge and the outward cut continued until it meets the upward cut from the lower surface at the angle (4). Lashing holes (5) are formed through the lower flange (3) in the orthodox way, from the wider upper surface to the angle of the flange with the inner surface. The under surface of the gunwale is marked through the hole (5) and a hole (6) bored from the mark to the angle (4). Lashings by the continuous loop method are made through these holes and they show on the inner side only. *c*, Upper surface showing junction of gunwale (1) with bow or stern cover (7) where straight line is interrupted by a right angled cut. *d*, Side view of junction of gunwale (1) with cover (7) by oblique cut, with gunwale below cover. The ridge (2) on the outer edge of the gunwale is not continued to the end. Some of the gunwale lashings are external (8). *e*, Section through external lashing. External lashings are in spaces between two inner lashings (*b*). The hole (5) is bored through the upper surface of the side section (3) downwards and outwards to come out on the outer surface. The gunwale is marked and the hole (6) bored upwards and outwards to emerge on the outer surface. The lashing (9) will thus show on the outer surface as in (*d*, 8).

In Tutuila, the lashing of the gunwale to the side pieces is termed *pu fangota,* in which the correct number to bring luck in fishing (*fangota*) is 15 on the right gunwale and 16 on the left and all must be on the inside. In the type Tau canoe, the right gunwale has 23 inside lashings, 7 lashings showing on the outside, and near the bow 2 lashings pass through holes bored transversely through the plank and the gunwale and thus show on both sides.

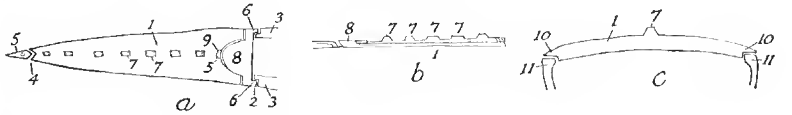


FIGURE 235.—The bow cover: *a,* upper surface (1)—width, 1 foot 7.5 inches at junction (2) with gunwale (3), and 2.8 inches at junction (4) with bow piece (5). The junction with the gunwale shows the right-angled join already seen in the gunwales and the aft edge is straight. The bow end is "V"-shaped to fit against the angular projection of the bow piece in the middle. The side edges fit accurately over the upper edges of the second tier sections and the sides of the bow piece. A median raised ridge 1.5 inches wide and the same in height is left on the upper surface, which, afer the cover is fixed, is shaped into 7 knobs (7) for carrying the shell ornamentation. The cover is 2 inches thick at the aft end and is continued forward in a raised semicircular part (8) from which there is a slight projection (9) forwards in the middle line. *b,* Longitudinal section of aft part, showing thick semicircular part (8) and raised knobs (7). The thickness of 2 inches aft diminishes to 1 inch at the bow end. *c,* Transverse section, showing transverse convexity with cover knobs (7) and side edges cut away on under surface (10) to fit over the flanged upper edges (11) of the plank sections beneath.

The bow cover. The bow cover (*tau*) is flat. It covers that part of the canoe between the bow ends of the gunwales and the small upper surface of the bow piece. In the Tau canoe, it is 6 feet 4 inches in length, covers the

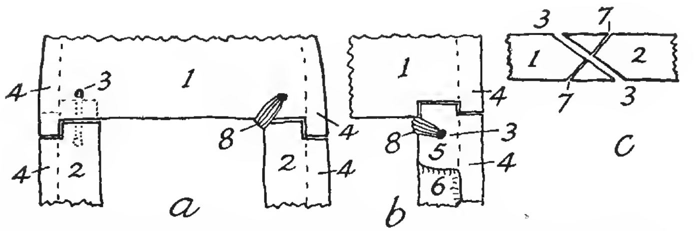


FIGURE 236.—Lashing bow cover to gunwale: *a,* upper surface, the bow cover (1) fits against the gunwales (2) on either side and by reason of the oblique join (*c,* 7) the lower surface of the end of the gunwale projects below the bow cover as shown by the dotted lines on the left. A hole (3) is bored through the cover downwards and backwards so that it passes through the solid part of the gunwale to the inner side of the part (4) that fits against the flange of the side section of the hull. *b,* Under surface with the narrow strip covered by the hull flange (4). The forward projection of the gunwale under the cover (1) is shown with the solid part (5) and the part cut away (6). The hole (3) from the bow cover side has emerged below through the solid part (5) of the gunwale to the inner side of the part (4) covered by the flange. *c,* Section through cover (1), gunwale (2), and hole (3), with oblique join (7). The braid is passed through the hole and comes up on the inner side in the angle between the cover and the gunwale, as shown by the lashing (8) in (*a,* and *b*).

hold from side to side throughout its length and has a mesial line of raised knobs. (See figure 235.)

The lashing of the bow cover to the gunwales receives the special name of *tuanga.* (See fig. 236.)

The lashing of the bow cover to the side pieces was done by two methods. Those with a method of joining two pieces of the cover together are shown in figure 237.

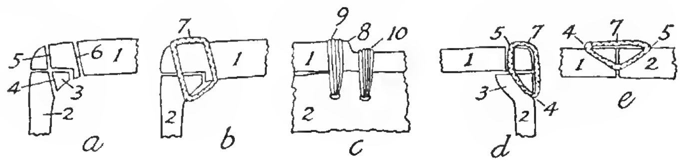


FIGURE 237.—Lashing bow piece to sides and lashing two sections of bow piece: 1, bow cover; 2, side piece; 3, flange of side piece: *a*, and *b*, first method in front of raised semicircular part on upper surface of cover. *a*, Section through cover (1) with its shaped edge fitting over flange (3) of side piece (2). A hole (4) is bored through the flange and the under surface of the cover marked. The hole (5) is bored through the cover from the marked point. The hole (6) is bored through the cover to the inner side of the hole (5). *b*, The braid (7) is passed down through the outer cover hole, through the flange hole and up through the second cover hole. With the continuous loop, the lashing is made from the outside and finished the usual way. The braid shows between the two holes on the upper surface of the cover. Three such lashings were spaced on either side of the bow cover. *c*, and *d*, Second method, at the thick part, curving inwards to form the raised semicircle. *c*, Side view of bow cover (1) where the raised part ends (8) and side piece (2)—showing lashing over thick part (9) and second lashing over thin part (10). *d*, Section through cover (1) and flange (3) of side piece (2). The hole (4) is bored through the flange, the cover marked and the hole (5) bored through the cover from the marked spot. The braid (7) is passed through and the lashing made. The lashing shows externally on the outer side of the side piece and the upper surface of the cover. *e*, Section of two pieces (1 and 2) of a bow cover used when suitable timber was not available for a bow cover in one piece. The pieces were 2 inches thick so the joining method was possible. The hole (4) was bored through the piece (1) and a similar hole (5) through the piece (2). The sennit braid (7) was passed through and the lashing made in the orthodox manner. In making the lashings with the sides, it was usual to pass a loop of braid through all the paired holes before lashing down the cover, as it was easier to lift the cover and pass the braid through each hole separately.

The stern cover. The stern cover (*velo*) is shorter than the bow cover and covers in the space between the ends of the gunwales and the upper surface of the stern piece. In addition to the ornamental shell stands in the middle line, it carries the important fishing rod post (*pou'ofe*). (See figure 238.)

The shell stands are termed *tulanga pule* (*tulanga*, stand; *pule, ovula* shell) from their function but they also receive the specific name of *salue.*

The stern cover is lashed to the gunwales and the side pieces in exactly the same manner as the bow cover.

The outrigger booms. In bonito canoes, two booms (*'iato*) are connected with the float and a middle one is short. The booms receive the

names of front, rear and inside (*'iato mua, 'iato muli* and *'iato loto*). The fore and aft booms were made of *poumuli* poles averaging 2.6 inches in diameter. The aft boom was 4 feet 10 inches long and the fore boom 2 inches longer. The middle boom was 3 feet 9 inches long and barely 2 inches in diameter. On the hull, the aft boom was 4 feet 5 inches from the fore edge of the stern cover. Between the aft boom and the middle boom, the distance was 4 feet 2 inches and between the middle and fore booms, 3 feet. The booms were laid across the canoe and the correct positions marked across the gunwales with charcoal. A single large hole to each boom was bored through the gunwales an inch below their upper edges and directly below the middle of the boom. The boom is replaced in position, with one end projecting but slightly over the right gunwale while the thinner end extends beyond the left gunwale. The under surface resting on the gunwales may be trimmed flat. The usual boom lashing with the single lozenge design and two alternative forms are shown in figure 239.

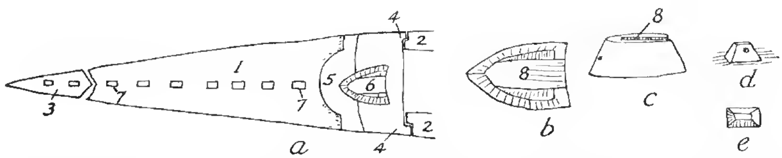


FIGURE 238.—Stern cover, rod post, and shell stands: *a*, upper surface (1)—length 4 feet 3 inches, width at junction with gunwale (2) 17 inches, width at junction with stern piece (3) 5.2 inches, bow edge straight with right-angled joins (4) with gunwales, stern edge "V"-shaped, thick bow with raised curved part (5), rod support (6) and seven raised shell stands (7) in middle line; *b*, rod post from above, slightly curved bow edge 5.3 inches wide, curved sides meeting in sharp edge in middle line, length in middle line 8.2 inches, inclined groove (8) 2.5 inches wide inclined upwards and backwards to support bamboo fishing rod at acute angle with stern cover; *c*, rod post from right side, height 3 inches at bow end and 3.75 inches at stern end, rod post cut out of solid wood with stern cover, hole cut through posterior edge for braid lashing of shells; *d*, shell stand, side view, 1.4 inches high with transverse hole bored through; *e*, shell stand from above, rectangular sides 2.5 inches long, ends 1.3 inches wide, sides and ends sloped upwards and inwards forming smaller upper surface. The shell supports are cut out of the solid median ridge left on upper surface of cover.

The float. The float (*ama*) is made of *fau*, a piece of the required thickness being selected and merely the bark removed. The length cannot be determined until it is fitted to the canoe. The rule is that the fore end comes up level with the cutwater of the bow. When the position of the aft pair of peg connections with the boom has been determined on by temporarily trying them in position, the aft end is cut off square about an inch behind the insertion of the pegs into the float. The short, square aft end of the float is typical of Samoa. Never under any circumstances is the aft end of the float left long or sharpened. The fore end is trimmed to a blunt point by cutting away the upper surface and the sides, but very little of the bottom. The float of the

Tau canoe is 15 feet long. The diameter at the aft end is 4.4 inches by 4 inches and the fore end aft of the sharpened point, 4.1 inches by 3.9 inches. The wider diameter lies flat with the water.

The float does not lie parallel with the keel of the canoe but is closer in towards the bow. At the aft boom, the nearest part of the float and the keel are 38 inches apart while at the foreboom they are 33 inches apart.

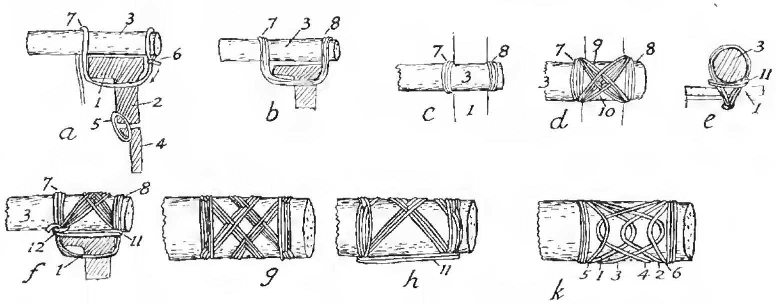


FIGURE 239.—Lashing outrigger boom to gunwale, decorative designs: 1, inward projection of gunwale; 2, lower part of gunwale; 3, boom; 4, side piece; 5, inside lashing of side piece and gunwale. *a,* Section through right gunwale showing position of hole made an inch below the upper edge and passing through below the inner projection (1) of the gunwale. The braid is tied in a running noose (6) around the outer end of the boom. The free end of the braid is passed through the hole and makes a transverse turn (7) around the boom on the inner side of the gunwale. *b,* The braid is passed back through the hole and makes a transverse turn (8) around the outer end of the boom. The braid is passed in and out through the hole until 4 transverse turns have been made around the boom on either side of the gunwale. *c,* View from above, showing two sets of transverse turns (7 and 8) around the boom (3). *d,* View from above. Diagonal turns (9, 10) are made over the boom between the two sets of transverse turns (7, 8), the braid passing through the hole after each turn and coming up alternately on either side of the boom to form crossing sets to develop the single lozenge pattern. *e,* Transverse section through boom. When five or more diagonal turns in each direction have fully developed the lozenge design, a few horizontal turns (11) are made around the lashing between the boom (3) and the gunwale (1). *f,* side view section through gunwale. The characteristic circumferential turns (11) tighten up the lashing and prevent the outer transverse series (8) from working over the end of the boom. The end of the braid is pushed through the clear space between the round boom and the flat gunwale and passed under the oblique and transverse turns around which it fixes the lashing with a couple of half hitches (12). *g,* Savaii decorative design viewed from above. *h,* Same Savaii designs seen from the side, also circumferential turns (11). *k,* View from above. Tau design termed *fausanga fa'a'iato* (canoe boom lashing) held to be true canoe boom lashing and though used on wall posts it retains the canoe boom name. The figures indicate the order in which the curved loops were made.

Attachment of booms to float. The booms being straight, the attachment to the float is always indirect by means of two pairs of pegs (*tu'itu'i*) to each boom. The middle boom, falling short of the float has no connection with it, but serves as a brace to the gunwales, a back support to the front seat, and an additional means of carrying the canoe if needed.

The connecting pegs are made of ironwood (*toa*) about 0.7 inches in diameter at the thicker lower ends. Their length is decided when fitting takes place. The lower ends are sharpened for insertion into holes in the float, and the bark is usually left on the pegs. The fitting and lashing of the booms takes place outside the shed, as after it is done the canoe is carried down to the lagoon and tested. The float is laid on the ground at its correct distance from the canoe and then raised by putting pieces of wood under it to get the right level with the keel of the canoe which rests on the ground. When the float is adjusted to suit, stakes are driven into the ground to the outer side of the float and the long booms tied to them to maintain their relative position with the float.

The aft boom is lashed first. The pegs consist of an inner and outer pair, each of which embraces the boom and is lashed together as a pair. The boom and the float being in correct relative position, the pegs are tried in position. The inner pair is tested and the length of the outer pair made the same with the result that the angles made by each pair with the boom and the float are the same. The points where the four lower ends touch the float are marked and four shallow holes not more than an inch deep are drilled in the upper surface to form a pair on either side of the middle line. Transversely between pairs, the holes are 1.75 inches apart and longitudinally between individuals of a pair, they are 2.25 inches apart. As the diameter of the boom at this part is 2.6 inches, the individuals of a pair diverge slightly at the upper ends. The sharpened lower ends of the inner pair are placed in the holes and the upper ends directed upwards and inwards towards the canoe to embrace the boom and get the right angle of inclination. Holding them together against the boom with the left hand, the upper ends were marked so that they come above the point on the outer circumference of the boom that they touch but barely up to the highest upper level of the boom. They are then cut off square at the marks. In this way the length of the pegs is decided. It happens in the Tau canoe, that they are 12.5 inches long including the inch buried in the holes. They are replaced, held in the same position, and the lashing of the inner pair proceeds. (See fig. 240.)

The outer pair of pegs is lashed in the same way as the inner pair. The distance between the peg pairs on the boom is 10 inches. The Tau canoe was made with pairs of equal length, but some craftsmen do not seem to bother so long as the float is kept at the right distance from the boom. In some canoes, the inner pair was longer than the outer and different angles ensued with a wider space at the upper ends.

The depth from the under surface of the aft boom to the under surface of the keel in the Tau canoe is 15 inches. The similar measurement between the aft boom and the float is 12.5 inches, making a difference of 2.5 inches in

the lower level of the two. Slight as it is, it is important from the fact that it is always taken into account in setting the float in position.

The lashing of the fore boom differs only in the greater depth of the float from the boom. Thus where the nearest parts of the aft boom and the float were 8.5 inches apart, the distance of the fore boom was 12 inches. The pegs were correspondingly longer, each pair being 17 inches as against the 12.5 inches of the aft pegs. The lower ends were the same distance apart (1.75 inches) transversely, but the individual pegs of the same pair were 3 inches apart. As the boom in this part was 2.5 inches in horizontal diamteer, the upper ends of the pegs converged slightly as against the slight divergence of the aft pegs. Neither the slight divergence or convergence is of much moment except to show that the lower ends of each pair of pegs is approximately a similar distance apart on the float as they are on the boom, which is important as a type of local technique. The upper ends of the pairs were 15.5 inches apart. (See Plate XXXIX, *B*.)

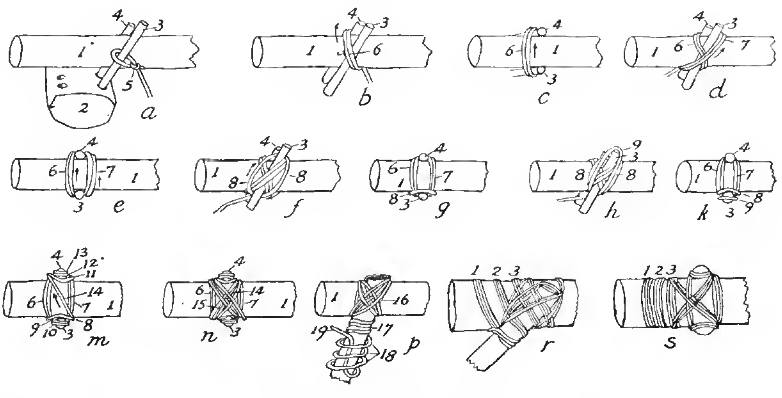


FIGURE 240.—Lashing connecting pegs with float to boom: 1, boom; 2, float; 3, 4, connecting pegs; other figures, lashing turns: *a,* side view, the lashing braid is tied to the near peg (3) with a running noose (5), the pegs make diagonally opposite pairs of acute and obtuse angles with the boom, the pegs are left long above the boom to assist the diagrams; *b,* side, the left hand holds the ends of both pegs firmly against the boom while the right makes a few turns (6) with the braid around the pegs and the boom through the obtuse angles; *c,* view from above showing transverse turns (6) over the boom on the float side of the pegs; *d,* side, the braid is crossed under the boom to the float or acute angle side of the peg (3) and a set of turns (7) are taken around pegs and boom through the acute angles to cross the first set (6) diagonally on the outer side of both pegs; *e,* from above, showing the second set of turns (7) crossing transversely over the boom on the canoe side of the pegs; *f,* side, the braid makes the usual circumferential turn (8) around the lashings between the near peg (3) and the boom (1); *g,* from above, the loop of the circumferential turn (8) is clearly seen between the near peg (3) and the boom (1); *h,* side, another circumferential turn (9) is made but instead of passing between the near peg and the boom, it passes directly over the top of the near peg (3); *k,* from above, showing the circumferential turn (9) passing over the top of the near peg (3); *m,* from above, another circumferential turn (10) is made over the top of the near peg and the braid crosses under the boom to the far side. An ordinary

circumferential turn (11) is made between the boom and the far peg (4) and then two circumferential turns (12, 13) over the tops of the pegs are made to anchor the pegs down to the lashing and prevent an upward push by the float driving the pegs up through the lashing, the braid is crossed under the boom to the float side of the near peg, crosses it diagonally to appear on the canoe side, whence it makes a diagonal turn (14) across the space between the two transverse sets (6, 7) and passing to the float side (left) of the far peg (4), it crosses its outer surface downwards and to the right. *n*, From above, the braid crosses under the boom to the right side of the near peg, crosses over it to its left side, and then crosses the upper surface of the boom diagonally (15) between the two transverse sets (6, 7), crossing the first diagonal turn (14) to reach the right side of the far peg, the braid descends by crossing the far peg to the left and crosses directly under the boom to the left side of the near peg where it is back to the commencement of the first oblique turn (14). By continuing the two sets of oblique turns alternately to either side of the first turns (14, 15), the single lozenge design is developed on the upper surface of the boom as shown. *p*, Side view, in making the oblique turns carefully, the lozenge pattern (16) is also developed on the outer side of each connecting peg. The lozenge design being completed and the lashing firm, the braid is run down the near peg in a few close spiral turns (17) and 3 or 4 loose spirals (18) are made over the left forefinger held against the peg; the finger is removed, the braid end (19) pushed up under the loose turns from below, the loose turns drawn taut in order from above, and the braid end pulled upwards to remove the slack. The braid is cut off close to the turn from under which it emerges and the lashing is complete. *r*, Side view, Savaii lashing, with series of turns (1, 2, 3) distributed over wider area of boom on float side; *s*, from above, Savaii lashing with series (1, 2, 3) crossing transversely over boom.

The peg connection with the float is not made secure. The points are placed in the shallow holes of the float, not to hold the float to the boom but to keep the lower ends from slipping off. Strictly speaking the pegs in a bonito canoe are not really attachments. They act as rigid struts to keep the float at its proper distance from the boom. When the canoe is in the water, the force is mostly downwards against the float from the boom through the pegs. The float withstands this downward thrust and so balances the canoe. When the canoe rolls to the right, however, the booms lift and there is a strong tendency for the pegs to come out of the shallow holes in the float. Also in carrying a canoe, the float will drop off through its own weight if it has to depend on the connecting pegs alone for its attachment to the boom. A suspensory sennit is therefore used to supplement the peg attachment.

The fallacy of generalizations is well illustrated by the pegs of the Samoan bonito canoe. In Aitutaki, Cook Islands, a *Y*-shaped connecting peg is used without any additional lashing. The forked limbs are attached to the boom and the straight stem driven well down into the float. In some cases, it shows through on the under side of the float. Canoes are sailed with the float at times well out of the water as the canoe heels over. Here the connecting peg serves as a suspensory attachment as well as strut and so differs materially from the Samoan connecting peg.

Suspensory float attachment. The suspensory attachment (*li*) between the boom and the float is of vertical form, the braid passing around the boom

between the upper attachments of the pegs and around the float between the elements of each pair. (See fig. 241.)

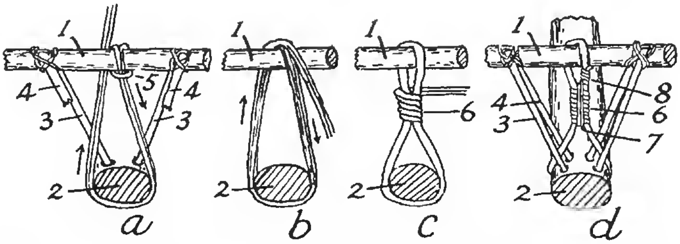


FIGURE 241.—Suspensory sennit attachment (*li*) between boom and float: 1, boom; 2, float; 3, fore pegs; 4, aft pegs cut off; back views with sections through float between fore and aft pegs: *a*, a length of braid is doubled, the loop passed forward over the boom and brought back under it, the two limbs of the braid are passed through the loop (5) and drawn taut, the doubled braid is brought down the right side of the float between the inner pegs, passed under the float and up between the outer pegs, whence it passes upward behind the boom; *b*, the braid is brought over the boom and a number of turns made around the float and boom in the same manner as the first turn; *c*, the number of vertical turns being sufficient, a series of close transverse turns (6) are made around both limbs of the lashing, which draws them together and tightens up the lashing; *d*, a couple of longitudinal turns (7) are made over the transverse turns by passing the braid between the diverging limbs above and below; a couple of turns are taken around one of the upper limbs and the lashing fixed with a couple of half hitches (8).

In Savaii, the suspensory lashing was made with two sets of turns around the float, as in figure 242.

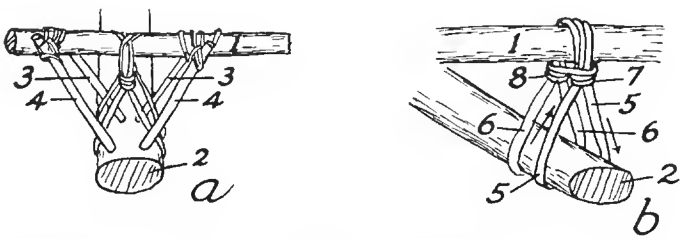


FIGURE 242.—Savaii suspensory attachment of boom and float: 1, boom; 2, float; 3, fore pegs; 4, aft pegs, back views: *a*, completed attachment, showing two sets of turns around float, made between fore (3) and aft pegs (4); *b*, showing sennit braid turns. The braid is fixed to the boom and makes the first turn (5) around the float, but it passes over the boom on the same aft side; passing over the boom to the front, the braid makes a second turn (6) around the float and returns up over the boom on the same front side. The two series are continued on either side of the boom until sufficient turns have been made. A series of half hitches (7) are made around the two limbs of the first set (5) and the braid passes directly across to make a series of half hitches (8) around the two limbs of the second series (6), which completes the attachment.

The *li* lashing, therefore, keeps the float attached to the boom when any pull comes on the float or boom that would tend to separate them. It also keeps the float firmly up against the lower ends of the pegs and helps to keep the

float in the correct relative position to the canoe. The lashing and the pegs are complementary to each other. As the bonito canoe is a deepsea fishing canoe which is carried down to the water, the float does not drag against the bottom. The turns of the *li* lashing which pass round the bottom of the float are thus not worn by any friction. When the peg connections and *li* lashing have been made, any extra length of boom is cut off about 4 inches beyond the outside peg lashing.

The steering seat. In eastern Samoa, the crew of the bonito canoe usually consists of three. The two forward seats are simply cut out of a plank of the length of the outer width of the canoe at the gunwales just in front of the aft and middle booms. They are about 6 inches wide and the under surface of the two ends are shaped to fit over the upper surfaces of the gunwales.

The steering seat (*nofoanga*), however, is specially made as it takes part in supporting the lower end of the bamboo fishing rod for the use of which the canoe was made. (See fig. 243.)

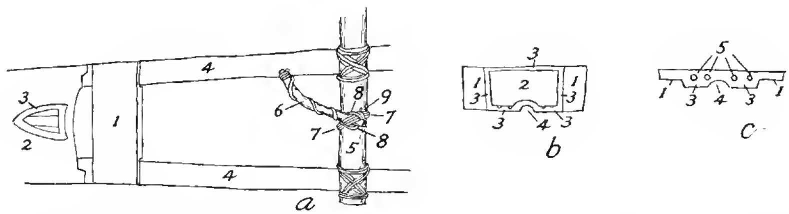


FIGURE 243.—Stern seat and hand hold: 1, stern seat; 2, stern cover; 3, fishing rod post; 4, gunwales; 5, aft boom; 6, hand hold: *a*, stern seat to aft boom, from above, the stern seat (1) in position, 2.25 inches from stern cover (2) fits over both gunwales (4) with which it is flush on outer edges. The hand hold (6) consists of a bent ironwood branch 0.75 inches in diameter. A hole bored through inner projecting part of left gunwale 7.5 inches from aft boom; sennit braid fastened to slightly flattened aft end of branch with slip noose, passed through hole in gunwale and turns taken around branch to fix aft end; a couple of circumferential turns around lashing between branch and upper surface of gunwale; braid run spirally around branch to reach other end which is lashed to aft boom with oblique turns (7) around boom and branch and circumferential turns (8) finished off with couple of half hitches (9), around oblique turns. *b*, Under surface of stern seat, length 18.25 inches, width 6.5 inches, made of plank 2 inches thick, under surface cut away at ends (1) to 3.5 inches wide and 1 inch thick to fit over gunwale; intermediate part (2) hollowed out to 1 inch thickness, leaving a raised flange (3) along edges including allowance for groove (4) cut in middle line of aft edge; *c*, stern seat, back view showing thinner ends (1) to fit over gunwales, the raised flange (3) with mesial groove (4) and two pairs of holes (5) bored transversely through flange.

With the seat in position a length of braid is passed through each of the outer holes of the seat and a loop taken around the backward projections cut on the piece in the bottom tier (*tatao*) already mentioned. This projection (*fa'alave*) is behind the steering seat under the stern cover. (See fig. 232, *b*.) The turns of braid (*laoa*) prevent the seat moving forward. Some seats have holes through the front flange of the seat and have *laoa* lashings passing for-

ward to *fa'alave* projections formed on the planks of the bottom tier in front to prevent the seat from sliding back.

Through the two inner holes a loop is formed of a few turns of sennit braid. The loop which projects backward is then closely seized with spiral turns of the braid so as to stiffen the loop and keep it open. The loop ends are on either side of the groove at the back of the seat. The two form an opening into which the small knobbed end of the fishing rod handle is set, while the rod is leaned back against the slanting surface of the rod post on the stern cover.

Much difference of opinion exists regarding the correct names of the various parts for holding the rod, but Manua, Tutuila, and Savaii seem to agree the braid loop itself is the *futia*. The handhold (*pu'enga*) is shown in figure 243 *a*, 6.

The diagonally lashed stick forms a hold for the left hand of the steersman as he leans forward to swing in the bonito rod with his right. In Savaii, the hand support is called *pu'enga* and in eastern Samoa, it receives the somewhat general name of *manu*. The handhold should be grasped quietly without any sudden jerk and the swing of the rod made evenly and smoothly. This applies to the activities of life, hence the saying, "Ave malu i le pu'enga" (Grasp the hand support gently).

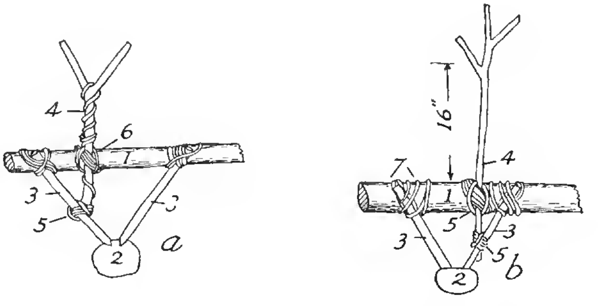


FIGURE 244.—Fishing rod forward support (*lango'ofe*): 1, boom; 2, float; 3, aft connecting pegs; 4, rod support: *a*, a forked stick (4) of ironwood or other suitable wood is selected with a slight bend at the lower end, and of such a length that the fork will be almost 7 inches above the boom. The lower outward bent end is laid against the front side of the aft outer peg and lashed with transverse and circumferential turns (5), the braid is run spirally around the stick and reaching the boom, some oblique turns around the stick and the boom are made, finishing off with a couple of circumferential turns (6). The braid is run spirally up to take a turn over the fork and returning towards the boom is finished off with a couple of half hitches around the stick. The braid may not be run over the fork and the stick may be tied to the inner peg instead of the outer. *b*, Stick with two forks for carrying 2 rods as in Savaii. The stick is tied to the inner peg and the lower fork is 16 inches above the boom. The lashings to the peg and the boom are the same as in (*a*). The characteristic Savaii lashing (7) of connecting pegs to boom is shown.

Outrigger rod rests. In action, the bonito rod stretches obliquely upwards over the stern with its lower end supported by the *futia* loop and the rod post. In going to or returning from the fishing grounds, the rod lies horizontally across the outrigger booms. There are two supports for the rod to prevent it from rolling off the booms: *a,* the fore support (*lango'ofe*) consists of a forked stick attached to the outer end of the fore boom and one of the connecting pegs (see fig. 244); *b,* the aft support is tied to the aft boom closer to the hull than the fore support, being on the hull side of the middle of the boom. It is also low, the fork or loop being level with, or just above, the boom. Three forms seen are shown in figure 245. In Tutuila the aft support was called *manga mate* and in Savaii, the canoe owner called the loop an *umele,* which differs from the usual Savaiian meaning of that word. The narrow knob on the butt of the rod handle rests on or in the rear support. The rod thus lies obliquely between the rests with the handle part within easy reach of the steersman, and the outer end well raised.

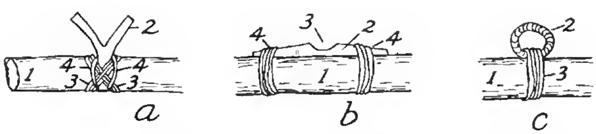


FIGURE 245.—Rear support for fishing rod: *a,* a short fork (2) is lashed to the boom (1) with diagonal crossing turns (3) and finished with circumferential turns (4) (type common in Manua). *b,* A piece of wood (2) with a groove (3) is laid on the boom and lashed with transverse turns (4) at either end (seen in Tutuila); *c,* a seized loop of sennit braid (2) is tied to the upper surface of the boom with transverse turns (3) passing through the loop (seen in Savaii).

Shell ornamentation. The properly set-up bonito canoe has a row of shells down the middle line of both bow and stern covers; one mounted on each knob (*salue*). The numbers vary, but in the canoe from Tau', the bow set consisted of eight: seven shell supports on the bow cover and one on the upper surface of the bow piece. The stern set consisted of nine, there being two on the stern piece and seven on the stern cover. The white shells used are called *pule* (*Ovulum*) and are difficult to get in Samoa. They came in the way of presents (*taulanga*) to high chiefs. Some of the sets have been in the possession of some families for a considerable time. When a bonito canoe rotted and was abandoned, the shell ornamentation was transferred to the new canoe.

Each shell had a small hole cracked through the back not far from the rim to allow the sennit braid lashing to pass through. Commencing at the stern with the craftsman on the right side of the canoe, the lashing commences with the end support on the left. There is one shell to each support. The raised supports have a hole drilled through each from side to side trans-

versely to the long axis of the support and of the canoe. All the natural slit openings of the shells must face one way towards the worker. The long axis of the shell with the long axis of the natural opening lies horizontally and longitudinally on the support. (See fig. 246.)

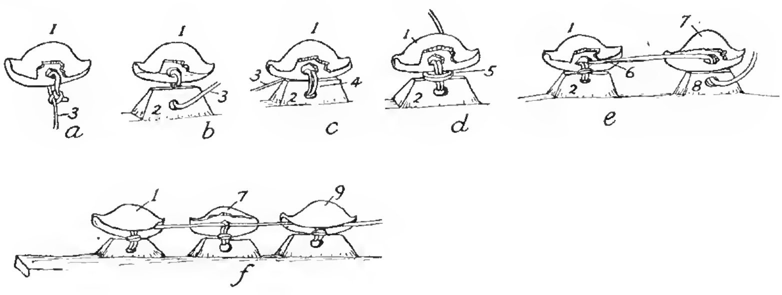


FIGURE 246.—Lashing *ovulum* shells on bow and stern covers: *a*, the end of the braid is passed through the hole in the first shell and then tied with an overhand knot around its standing part to make a running noose which is drawn taut around the lower rim of the shell. In the figures the shell is cut away to show the hole which otherwise cannot be seen from the front. *b*, The shell (1) is placed on the end support (2) and the braid (3) brought through the support hole from the far side; *c*, brought up vertically from the support hole, and passed through the shell hole from the near side. It is then continued through the support hole from the far side and up through the shell hole from the near side, making two vertical turns (4). After passing through the shell hole to the back, the braid (3) is brought to the left. *d*, Two horizontal circumferential turns (5) are taken around the vertical turns from left to right on the near side. *e*, After the braid passes to the back on the second horizontal turn, it is brought forward through the shell hole from the back (6) and passes to the right to the next shell (7) which is set on the next support (8). Passing on the near side of the second shell (7) the braid is passed back through the shell hole and then brought forward from the back through the hole of the second support (8). This is the position in (*b*) from whence the process is repeated with each shell. *f*, The first shell (1) is shown as it really appears and the second (7) with part of the shell removed to show the braid. In the real condition the horizontal stretches of the braid and the turns passing through the shell hole cannot be seen. The end of the braid is carried on through a hole bored transversely through the thinner aft part of the rod post, drawn taut, and tied. The bow ornamentation is lashed in the same way commencing at the bow end. Here, as the craftsman had to stand on the left side to have the commencement on his left, the shell openings all face to the left. After lashing the shells the braid end is passed through a hole made through the little forward projection from the semicircular raised part of the bow cover.

In Manua, the braid of the bow ornamentation is sometimes taken back with a circumferential turn around the lashing of each shell between the shell and support. This is to strengthen the bow lashings as the bow gets rougher treatment in plunging through the waves. The stern ornamentation does not need the extra support. (See Plate XXXIX, *B*.)

The lashing of a shell to the end of the middle boom was a sign of distinction in Tau where the privilege was confined to the Tui Manua and the Fiti family.

Owing primarily to the scarcity of the proper ornamental shells in Samoa and secondarily to the breaking down of old time values which accompany the establishment of a foreign culture, the shell ornamentation has been abandoned in most parts, with the exception of the Manua group where it was seen in use. The bonito canoes, however, are still made with wooden supports because the canoes are built by a guild who retain the full technique of their craft. The question of adding shells is for the individual owner who may not have a set of shells available. The wooden projections remain unbored and survive as the mechanical part of the ornamentation having now become the entire ornamentation themselves. It is doubtful if any owner would consent to his canoe being built without them. He looks upon them as a necessary part of a bonito canoe which every person of status must have. He pays for the canoe and expects value for his money.

Timber used. It can now be appreciated more fully that various timbers were used for different parts of the same canoe. In the canoe from Tau, the hull planks were of *fau* but the bow piece was of breadfruit wood and the stern piece of *fu'afu'a*. The right gunwale was of *pata*, and the left of *fau*, the bow cover of *fu'afu'a*, and the stern cover of *futu*. The float and seats were of *fau*, the booms of *poumuli*, and the connecting pegs and handhold of ironwood. In the selection of timbers, expediency plays a large part. There are always alternative timbers and if one kind is too far away in the forest, the nearer one is used. Timbers that have been proved unsuitable were, of course, never used. The craftsmen knew the material of their particular

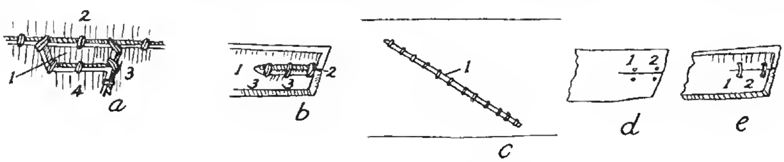


FIGURE 247.—Patches and repairs: *a*, patch made while canoe was being built. The small patch (1) has been fitted into the angle between the three plank sections (2, 3, and 4), when the planks were 2 inches thick. After fitting, the flanges were made on all edges and the patch (1) lashed to all three planks with the usual flange lashing. *b*, A plank split before it was dubbed out. Besides the edge flange, flanges were made on either side of the split (2) and the flange lashings (3) made to keep the split together. *c*, Crack 25 inches long in old canoe in Tutuila. Holes were bored right through the wood in pairs on either side of the crack and 1.5 to 2 inches apart. A strip of bamboo (1) 0.5 inches wide was laid over the crack on the outer side of the canoe, with the inner concave surface of the strip against the canoe. Transverse lashings were made with each pair of holes over the bamboo and through to the inner side of the canoe. The lashing turns show on both sides of the canoe. *d*, Old split repaired by making two pairs of holes (1, 2) on either side of the split and transverse lashings through holes. The lashings are fixed by driving wooden pegs into the holes from outside. The outer ends of the pegs are cut off and also the lashing turns on the outside. *e*, The repaired split in (*d*) showing inner surface with the braid turns (1, 2) intact and kept in place by the pegs. This method follows the technique used in figure 233.

districts. What was used in one district might not be used in another, simply because of the varying quantity in the distribution of plants, as well as the varying distribution itself.

Repairs. When damage occurred to a plank resulting in loss of material, the whole plank had to be removed and a new one of the same size made, with flanges at all edges for joining. Patches could be put in before the sections were thinned down, as the thick material allowed flanges to be made at any shaped edge. Similarly, cracks could be repaired by the flange method, if the cracks occurred before the timber was thinned. Cracks in finished canoes could not be repaired by the flange method so alternative methods were adopted, as shown in figure 247.

Two-rod fishing. In Savaii, a short rod (*matila*) is sometimes carried in addition to the full length rod. The rod post is wider and has a lower groove on the right for the short rod. At the back of the steering seat there are also two sennit loops (*futia*), the right one again being for the end of the *matila*. The forward high-forked rest on the fore boom has two forks; the right one being for the short rod.

THE THREE BOOM PLANK CANOE

The *amatasi* was described to me by an old man in Manua, who had seen one, as a plank canoe made like a bonito boat but larger and with three outrigger booms. A platform was built across the booms and the canoe was sailed with a triangular sail. The mast was stepped to a raised rim on the bottom of the hold and lashed to the middle boom. The triangular sail had a spar along each of the long sides. The apex of the sail was held back to the stern and on a tack, the apex was swung around to the bow. A boom (*suati*) projected on the right side. This he remembered and also the phrase *"Tatao le suati"* (Press down the *suati*), which was used when the canoe heeled over on the outrigger side.

The *amatasi* was very fast and was used in catching *masimasi* (dolphin) which were trolled for with a baited hook. Kramer (18, vol. 2, p. 268) figures an *amatasi* model, the main features of which are shown in figure 248. Another of Kramer's models (p. 269) shows a triangular mat sail with light spars along each side and the apex turned to the stern. The mast, however, is attached apparently to a kind of middle boom, but does not pass down to the hold. The outrigger booms appear well above the gunwales and the model does not appear a satisfactory one as regards the booms and the details connected with it. A noticeable thing is the backward projection of the float.

Wilkes (42, vol. 2, p. 150) who did not see any double canoes, states that the longest canoes were 30 to 60 feet in length and built of planks with the typical flanged edges. They had a deck fore and aft and could carry 10 to 12

people. The fore deck was decorated down the middle line with large white *Ovula* (marine shells) attached to a row of pegs. This part formed the seat of honor upon which the Samoan chief easily sat with safety, but one of Wilkes' gentlemen had a very precarious time in keeping on it. The song sung to him was "Lelei tusa lava le tau mua" (Good above all is the part before).

"Having both a prow and stern, these canoes cannot be manoevred without tacking; consequently the outrigger that constitutes their safety is, in using their sail, alternately to leeward and windward, and does not, when to leeward, add much to the stability of the canoe. They carry less sail than the canoes of the other natives of Polynesia, and to guard against the danger of upsetting, the natives rig a sprit or boom (*suati*), projecting from the opposite side to that on which the outrigger is fitted. The boom is secured with guys to the top of the mast. When the wind blows fresh, some of the men go out upon it and thus balance or counteract the force of the wind. Those on the other side of the canoe are kept ready to go out on the outrigger when that becomes necessary. The sail is made of mat, of a triangular shape, with its apex below; some of these are ten feet high."

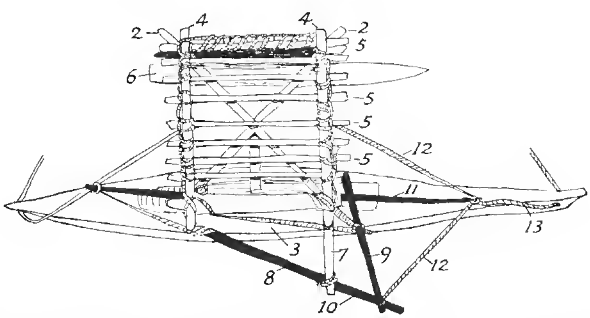


FIGURE 248.—*Amatasi* plank canoe (after Kramer). Short middle boom with 2 diagonal pieces of timber (2) crossing diagonally from the hull (3) to outer ends of the 2 outrigger booms (4). Above the crossed diagonals and below the outrigger booms, a number of spaced planks (5) form a platform which reaches to the outer ends of the booms. The float (6) is cut off square behind the attachments to the aft boom, but it does not project far forwards. The spar (7) is evidently lashed to the fore boom. A spar (8) is run out from the hull near the aft boom and lashed to the outer end of the spar (7) while another spar (9) also runs out to it. The part (10) is the *suati* (balancing spar). The spar (11) for the sail is shown down with the side stays (12) and a forward stay (13) attached to its end.

From the Wilkes' description, the canoes referred to were *amatasi*. As all canoes except the recent *taumualua* and the *'alia* had one float (*amatasi*), it seems likely that the use of the name *amatasi* for this type was to distinguish a larger plank sailing canoe from the double canoe.

THE BOAT CANOE

The *taumualua* was so called because it had two bow-shaped ends (*taumua* bow and *lua, two*). None are to be seen in Samoa at the present time. They were described to me as a long, wide canoe made of planks with raised flange

edges lashed together like the *'alia* and the bonito canoe. They had raised projections at the bow and stern which were ornamented with *pule* shells. The outstanding feature was that they had no outriggers but were sailed as boats. They were propelled with paddles, the crew facing the bow and using the paddles in the same way as in other types of canoe. They were much used in the Samoan fighting of the last century, when barricades were erected along the sides for protection against the firearms which had come into use.

Smith (32, p. 158), who saw them, gives the following particulars of one:

> The length was 60 to 70 feet and the width 7 to 8 feet. The planks were 7 or 8 feet long, 0.5 inch thick and sewn together like the *'alia* double canoe. The depth of the hold was about 3 feet and there were ribs 4 feet apart. It was decked fore and aft for 8 feet. The seats for the paddlers were 3 inches below the gunwale. The bow and stern pieces were of *malili* wood and the hull of *ifi lele*, or *fatau*. A triangular sail was used with the apex down. The mast rested on top of thwarts, where it was kept in position by stays. The steering paddle was 14 feet long with a 12-inch-wide blade.

Kramer (18, vol. 2, pp. 266, 267) figures a *taumualua* in the water, and two models. In all, the upward projections at bow and stern are present but have no bearing on ancient technique, as they are only present in the *taumualua*. The curved ribs extending from gunwale to gunwale across the bottom are distinct pieces of wood lashed to projections or flanges on the inner surface of the side planks. A horizontal piece on either side is lashed to the ribs and in turn supports the thwarts. One of the models shows the mast stepped to a longitudinal board attached in the middle line to two cross booms which rest on the gunwales. The mast is stayed with ropes. The triangular sail has the apex forward over the bow cover, while one side runs parallel with the lines of the gunwales, and the base is directed astern.

The whole technique is apparently native and surprising as a departure from the use of the outrigger. My Samoan informants in various parts of the group always enumerated the *taumualua* among the types of Samoan canoe and stoutly maintained that the canoe was not due to foreign white influence. Their proof was the native technique in building and the use of paddles. They failed to see my difficulty in accepting their claims to having invented a vessel without an outrigger. Only one old man said that the *taumualua* was not very ancient but must have come in about the same time as the missionaries. However, he, too, maintained that it was native to Samoa in that the Samoans made it. The claims of the present-day Samoan to the invention of the *taumualua* is an excellent example of the intentional fallacy of human memory. It gave them great satisfaction to think that they had a distinct type of canoe that others did not have.

However, Samuel Ella (11, *a*, p. 247) states that the *taumualua* was introduced into Samoa in 1849 owing to an incident in the Samoa "war of 1848-1851." Owing to damage to the property of British subjects, Captain Worth

of H.M.S. "Calypso" inflicted a heavy fine on Malietoa and his adherents, who were settled in a fortified position at Mulinuu Promontory near Apia in Upolu. He blockaded them with a long boat manned by a few marines. The opposing people of Aana and Atua were so interested in the success with which a vessel of the long-boat type could keep Malietoa's army blockaded that they desired a similar type of canoe. Mr. Eli Jennings, an American citizen living in the district, built for them two boats 50 feet in length on the model of a whale boat. Planks were fastened across the thwarts and bulwarks of bamboo raised. Fore and aft figureheads were erected and decorated with white shells. After obtaining these models by diffusion, they learned to make them themselves to a length of 50 or 60 feet and more. Hence the origin of the *taumualua,* which is interesting in the subsequent adaptation of Samoan technique to supply the lack of nails and sawn timber in carrying out a foreign idea.

THE DOUBLE CANOE

Stair (33, p. 152) states that the original Samoan double canoe, termed *va'a tele* (large canoe) was much larger than the more recently used one which has supplanted it. Two canoes, one much larger than the other, were lashed with crossbars amidship. A thatched shed or cabin was built on a stage projecting over the stern instead of amidship as in the Tongan type. They were much larger but more difficult to handle and could carry two bonito boats on deck if required.

The double canoe used in Stair's time, he states, is not original Samoan but an adaptation of the Tongan double canoe. This is the *'alia* and evidently warrants as little description as the *taumualua.* The canoe hulls were made of planks fitted together as in the true Samoan plank canoes.

The last full-sized canoe rotted away recently at Mulinuu near Apia owing to the deplorable lack of interest of those who might have preserved it for study by sending it to a museum. A model in Bishop Museum (Plate XL, *A*) serves to illustrate the general principles of construction and throws light on such important points as the technique of the deck, house, stepping of the mast, and arrangement of the sail. In the model both canoes are dugouts instead of being made of planks. The one on the right is larger and longer and has the deep Samoan bow and sloping stern. The smaller canoe on the left has the bow sloped in exactly the same lines as the stern and thus from size, shape, and position represents a large outrigger float. The fact that the canoe acting as a float is as high above the water as the main canoe does away with the need for intermediate connections between booms and float. Both canoes have front and stern covers. The raising of the woodwork to which the connecting cross booms (*'iato*) are attached and the provision of a deck are shown in figure 249.

In the model, the raised longitudinal planks and the raised transverse planks which well in the holds are dubbed out in one piece with the gunwale and the bow and stern covers respectively. In the full-sized canoe separate planks were used, the longitudinal planks (*vaeoa*) being lashed to the upper edges of ordinary gunwales (*oa*) and the transverse planks (*faniu*) being lashed to the bow and stern covers.

In the Samoan double canoe (*'alia*), the method of keeping the smaller canoe on the left in place of the float is similar to a similar procedure adopted

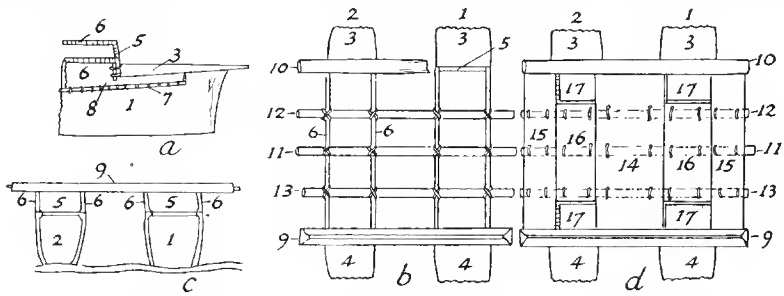


FIGURE 249.—Double canoe, cross booms, and deck: 1, larger canoe on right; 2, smaller canoe on left: *a*, bow end from right side. Each bow (3) and stern cover in the model at their inner ends are prolonged upwards at right angles into a thick transverse plank (5) which Kramer (18, vol. 2, p. 256) figures as the *faniu*. The gunwales have a similar upward projection (6). Both covers and gunwales are lashed to the upper edges of the hull by piercing holes in pairs right through on either side of the junction, laying a narrow lath of wood (7) over the outer side of the seam and lashing, as in figure 247 *c*, when the lashings show on both sides. Each pair of holes is lashed separately, the braid not being carried on to the next pair. The upward projections of the gunwales (6) and the covers (5) are lashed together at their vertical edges with the lath over the outer side of the seam (8). The transverse planks (5) of the covers fill in the ends between the raised gunwales and thus well in the hold of the canoe. *b*, Upper view, five crossbeams are used with their ends projecting well out over the outer sides of the 2 canoes. The stern boom is a wide dubbed-out plank (9) which is laid over the gunwales of the 2 canoes so as to overlap the upper edges of the transverse planks of the stern cover. The bow boom (10) is also wide and is placed in a similar relation to the transverse board of the bow cover. The bow boom (10) has been cut short in the figure to show the upper edge (5) of the transverse plank of the bow cover (3). The other 3 booms are rounded poles—a middle (11) and 2 intermediates (12, 13). The 5 booms are lashed to both gunwales of each canoe. *c*, Section aft of the stern boom (9) showing the boom resting on the gunwales (6) and over the transverse plank (*faniu*) of the stern cover (5); *d*, upper surface of deck, formed by laying spars or planks longitudinally over the 3 inner cross booms (12, 11, 13) the thicker outer end booms (9, 10) serving to define the forward and aft boundaries of the deck. The middle deck (14) is formed over the booms between the 2 canoes, the planks being lashed by holes bored through the planks on either side of the booms, the lashing passing around the boom and showing on the upper surface of the deck. Planks are lashed in the same way to the ends of the booms which project beyond the outer edges of both canoes (15). Finally, the intermediate parts over the canoe holds (16) are covered as far as the outer side of the 2 intermediate booms (12, 13) leaving the portions (17) between the ends of the short planks and the end booms as openings or companionways into the now covered holds of the 2 canoes.

with double canoes in the Cook Islands. Stair (33, p. 152) states that in the original Samoan double canoe (*va'a tele*), one canoe was smaller than the other.

The deck house and upper platform. The deck house (*falemanu'a*) is built over the middle deck with the ends about level with the companionways.

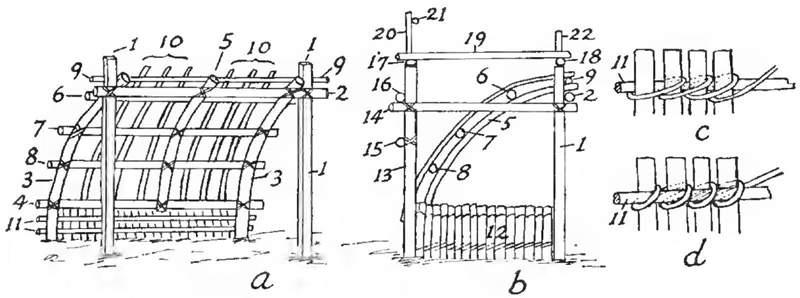


FIGURE 250.—Deck house and upper platform: *a*, inclined view from front. Two upright posts (1) are set up on the right side of the middle deck and the full length of the house apart and are termed *pou fale*. A crossbeam (2) representing the ridgepole is lashed to the two uprights. Two curved pieces of timber (3) termed *fa'asoata* are placed with their lower ends on the left edge of the middle deck, and their upper ends over the ridgepole to which they are lashed. The curved timbers receive their name from the *fa'asoata* method of house building with curved timber which forms both principal rafters and wall posts in one. Both the curved timbers and posts are mortised into the deck planks in the model. The horizontal beam (4) is lashed to the outer sides of the curved rafters (3) to act as a wall plate. A middle curved rafter (5) is placed with its upper end above the ridgepole and its lower end coming to just below the inner side of the wall plate (4). Three purlins (6, 7, 8) are spaced over the outside of the 3 curved rafters. Another horizontal pole to form the upper ridgepole (9) is lashed to the supporting posts above the main ridgepole. The thatch rafters (10) are lashed above the upper ridgepole (9) and to the outer side of the purlins and the wall plate. A low side wall is formed beween the wall plate and the deck by lashing two horizontal poles (11) to the outer side of the end curved rafters and attaching close vertical lengths of split bamboo to them. *b*, End view from stern showing curved *fa'asoata* rafters influencing the curved type of roof. The ends are also closed in with vertical strips of bamboo (12) attached by wrapped work technique to two horizontal poles as in the back wall. In the upper platform an upright post (13) is erected opposite the first post (1) and another upright opposite the other main post, making a set of 4 uprights of the same height. Supporting beams (14, 15, 16) are stretched between the posts to assist in staying them in position. The two original posts are in the long axis of the canoe and on the right while the other two are in the same axis and on the left. Longitudinal beams (17, 18) are lashed to the tops of the right and left pairs of posts and planks (19) laid across them to form the upper platform. Short uprights (20) may be erected on the left to support a hand rail (21) and a plank (22) be lashed on edge on the right. *c*, Outer side of split bamboo wall showing wrapped work technique where braid is tied to horizontal pole (11), passed over two strips of bamboo on the outside, passed around the pole on the inside to emerge again on the outside between the 2 strips and over two more strips on the outside. *d*, Inner side of wall with horizontal pole (11) and braid passing around pole and one strip on the inside. On the right side of the house, the posts may be doubled, with a shorter one to support the ridgepole of the house, and a longer one for the platform. The thatch is attached to the thatch rafters in the same method as thatching ordinary houses.

The framework of one side of a curved roof of the *fa'asoata* type is erected and thatched to provide protection as much from sun as from rain. Part of the framework is utilized to form an upper platform (*fata tele*) above the roof of the house. See figure 250.

The upper platform serves as a bridge and is occupied by the most august personage who is travelling.

The mast and sail. For the few details of Samoan names for the ropes and parts of the sail and the order with which they are dealt, I am indebted to the Samoan text in Kramer's work. (18, vol. 2 p. 257). The mast is divided into two parts: the main mast (*fana*), and the upper top mast (*tomotomo*) with an expanded end. (See Pl. XL, *A*.) The expanded part of the *tomotomo* looks like the end of a netting needle and the end may be open in some and closed in others. The main mast and top mast are fitted together with a slanting surface broken in the middle by a short surface at right angles to the main ones and lashed together with transverse turns of sennit braid.

The lower end of the mast fits against a wooden block (*tulafana*) which is fixed to the deck above the middle cross boom opposite to the right side of the house. (See figure 251.)

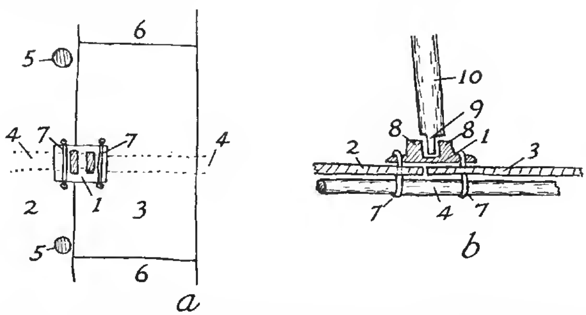


FIGURE 251.—Stepping the mast: *a*, upper surface of *tulafana* block (1) placed on a junction of middle deck planks (2) and right intermediate deck plank (3) above the middle cross boom (4) and thus midway between the front posts (5) of the deck house. The block is fairly large and rectangular with the under surface flat. Holes are bored through the middle and intermediate decks on either side of the block. The block is cut down at either end on its upper surface and a deep groove runs across the middle fore and aft line. The block is lashed by making turns (7) through the opposite paired holes, over the cut-down ends of the block (1), above and around the middle boom below. *b*, Section right and left through block; the block (1) is shown laying across the junction of the planks (2 and 3), and above the middle boom (4). The lashings (7) pass over the ends of the block, through the holes, and around the middle boom (4). The upper surface of the block is raised (8) with the median groove between, into which fits the tongue (9) cut on the lower end of the mast (10). When the mast is in position, it touches the ridgepole of the deck house on its left.

The sail (*la*) is triangular in shape with a wooden spar along each of the long sides and it is made of sections of plaited pandanus leaf treated like floor mats with a check plait. (See figure 252.)

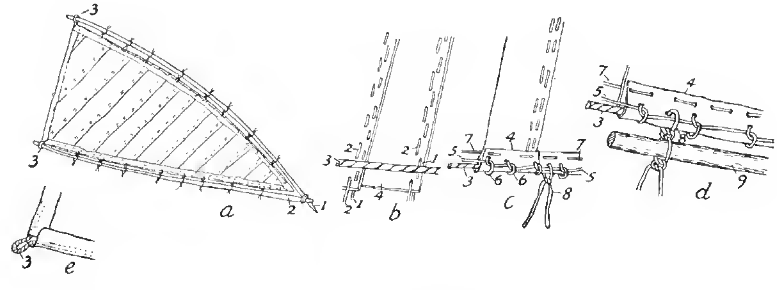


FIGURE 252.—The sail: a, The shape is triangular with long sides and a narrower base. Towards the base, the sides are slightly curved inwards. It is made of narrow widths of matting which run obliquely across between the two sides as shown. In use, the apex of the sail is directed down towards the bow and the long axis of the sail is directed obliquely upwards and backwards. *b*, After shaping the sail panels at the ends to get the general shape, the panels are joined together by overlapping the edges. In the figure, the right edges of the panels are above the left edges of those on the right. A strip of strong bast fibre or cord is run through both layers with a continuous wide stitch (1), the stitches alternately appearing and disappearing on each surface. When the first row (1) near the edge is completed, a second row (2) is made to its left, the stitches generally alternating with those of the first row. When all the panels have been joined together, the side and base edges are hemmed. Commencing on one side, a long two-ply cord or rope (3) is laid along the side a little in from the edge to allow a fair margin for turning in. *c*, The edge (4) is turned up over the rope (3). A strip of strong braid (5) is run along the edge to bind the matting edge back over the rope. Every here and there, it is looped around under the folded edge and pushed up through both layers of matting on the inner side of the enclosed rope. It is then drawn through its own loop (6) and so continues down the sail edge. The sail edge is thus strongly reinforced by the rope concealed in the folded edge and both edge and rope are bound by the braid (5). The turned back matting edge (4) is then also bound down to prevent it standing up untidily by passing a single continuous stitch of fibre (7) along near the cut edge and on the inner side of the binding braid. When the edge binding reaches an angle of the side with the base of the triangle, a loop of the rope is left out at the corner and the rope, continued on up the base. Along the base, the turned over edge is kept down with two or three rows of ordinary stitches. At the next corner, a similar loop is left out. A number of short pieces of braid (8) termed *aita*, are now attached at intervals to the sail edge. *d*, The *aita* are passed through the sail to the inner side of the concealed cord (3) and knotted at the sail edge with a reef knot. The long ends are left free (*c*, 8). These are tied along both side edges a little space apart and are used for lashing the sail to the sail spars (9). The two limbs are drawn round the spar and tied with a reef knot. *e*, The manner in which the rope (3) is left out at the corners is shown. *a*, The sail having been completed, a spar is attached to each side by means of the *aita*. The upper spar is called the *tilatu*, as it is the more upright of the two (*tu*, to stand), while the lower spar is called from its position, the *tila lalo* (*lalo*, bottom). The upper spar (1) is prolonged down beyond the apex of the sail, whilst the end of the bottom spar (2) is just long enough to lash to the upper spar where they meet beyond the apex of the sail. The lower end of the upper spar is pointed and fits into a hole bored into the bow cover at the bow of the right canoe. The upper ends pass through the rope loops (3) at the corners of the base.

The staying of the mast. On the *tomotomo* a little below the expanded portion are a couple of T-shaped projections situated fore and aft with the cross upwards and the whole cut out of the solid with the *tomotomo*. This may be merely model technique but it prevents ropes tied above them from slipping down. The mast stays are tied to the *tomotomo* above the projections. The mast is stayed on the right side by a single rope which is tied below to the middle cross boom (*'iato*) end which is made long enough to project beyond the right edge of the deck. On the left side there is a curious support called the *maile* consisting of two uprights let into the planks of the left side deck and lashed to them. They are on either side of the middle transverse line of the deck on which the mast is stepped. A rounded crossbar is lashed to their upper ends. To the outer side of the *maile* are two pairs of holes bored through the deck plank towards the outer edge. Two side stay ropes pass from the mast *tomotomo* down through the inner hole of each pair, up through the outer, and are then wound around the crossbar of the *maile*.

To accommodate the fore and aft stays there are two projecting lugs, on the inner or left side of the bow and stern covers of the right canoe, and close towards their outer ends. Through these projecting lugs, holes big enough to take a rope are bored. In the model, one end of a long rope tied to the *tomotomo* passes forward through the fore lug, back along the deck, through the stern lug and back to *tomotomo*. It is a continuous rope and being taut holds quite firm owing to the oblique pull through both lugs. This rope is called the *tu'u* and sets the forward inclination at which the mast is set. The angle of the mast can be set in a fore and aft direction owing to the nature of the tongue at the lower end which fits into the *tulafana* groove. The rope for hoisting the sail is tied to the upper spar (*tilatu*) and passed through the large upper opening in the *tomotomo*. Everything being ready, with the stays tied to the *tomotomo* and the sail rope termed *maca sisi* (hoisting rope) passed through the hole of the *tomotomo,* the mast is stepped and raised. The side stays are held and the *tu'u* fore and aft stay rope pulled or slacked until the mast has the right angle. The side stays are lashed to the middle cross boom and the *maile*. The sail rope is pulled to hoist the sail, and the lower end of the top spar placed in the bow hole. When the top spar reaches the *tomotomo* and the set of the sail is right, the sail rope is lashed to the projecting middle boom on the right.

The canoe is steered with a long paddle. The upper platform is reserved for the high chief of the travelling party, while the lesser chiefs, adherents, and crew occupy the deck. There are other details of decoration and construction in the model, such as handrails but they do not affect the principles of general construction.

Calking. In calking the joins between planks in the larger canoes, a strip of *lau u'a* bark cloth was smeared with breadfruit gum and laid on the upper

edge of the lower piece. The upper plank was then laid over it and the lashing proceeded with.

Paddles. The favorite wood for paddles is *milo,* but *tava, ifi,* and *manaui* are used. The typical shape is shown in Plate XL, *B.* The handle is straight and round, or bluntly elliptical in section. Its length ranges between 34 and 38 inches, about 1.5 inches in diameter at the upper end and thins down gradually to about 1.25 inches in transverse diameter at its junction with the blade, and less in the antero-posterior diameter.

The blade is a straight continuation of the handle though there may be a slight longitudinal concave curve on the front surface. The paddle is dipped into the water in front, is pulled towards the paddler and finishes the stroke behind him. The surface towards the paddler at the commencement of the stroke is thus the surface which does the active work and will be alluded to as the front while the other surface which faces the bow is the back. The blade meets the handle on either side at a clean-cut angle and then slopes outwards and with a fairly sharp curve until the blade reaches its widest part. The widest part is not far from the junction with the handle. The length of a fair-sized paddle blade is somewhere about 29 or 30 inches. In such a blade the widest part is from 5.5 to 6:5 inches from the top. From the widest part, the sides slope evenly down to a blunt point. The back of the blade continues straight down from the back of the handle. Longitudinally it is straight but may show a slight concavity owing to the slight hollowing out of the wide part. Transversely the back is slightly concave in the wide part due to deliberate working to thin the blade. The front of the blade commences with the full thickness of the handle. This thickness may be continued down the middle line as a distinct raised rib of the full width of the handle above and narrowing gradually until it merges in the front surface, or it may continue down as a median edge from which the sides slope evenly outwards. In either, the surface slopes backwards and outwards from the middle line towards the sides. This gives the front a transverse convexity which is continued to near the point, and according to the Samoans allows the water to run off. It is to comply with this front convexity that the back is hollowed out to obtain the lightness of the paddle.

The blade below the upper thicker part is dubbed down to an average thickness of 0.3 inch with 0.2 at the edges. The greatest width of the two paddles figured is 7.5 and 8.25 inches respectively. The surfaces and edges meet at the lower point evenly without any special curves, knobs, or projections.

A variation of type is seen in the *paopao* paddle (Pl. XL, *B,* 1). The blade of 21 inches length, reaches a maximum width of 8.75 inches only 2.75 inches from the handle junction. This results in a distinct rounded angle at the widest part.

Bailers. Bailers are called *tata* and to bail out a canoe is *tata* and *asu.* Wooden bailers are usually made of *fau*. The bailers seen consist of three kinds:

1. A half coconut shell is used in the *paopao* canoes.

2. The long narrow bailer without a handle (Pl. XL, *C*, 1) is used in the bonito canoes. It has a narrow front which accommodates itself to the narrow upper surface of the keel of the bonito canoe which may be still narrower owning to the *tali tata* projections.

3. The bailer of larger canoes (Pl. XL, *C*, 2) is the typical Polynesian sugar scoop form with a median handle projecting forward from the upper edge of the back.

Anchors. Pieces of discarded iron have displaced the stone anchors (*taula*) used with *paopao*. Some of these had holes drilled through. A *fue* vine which lasts longer in the water was used as a rope.

Masts. The mast (*fana*) of the double canoe has been described. It is called *fana* while the word *tila* is used for the spars of sails. Pratt mentions (23, p. 319) that *tila* is now being used for mast. In eastern Polynesian the word *tira* is used for the mast.

CUSTOMS AND USAGE

There is nothing to be added to what has been said about the making of the smaller dugout canoes. They were common and did not enter into the ceremonial which surrounds expert craftsmanship. The plank canoes which involved the laying of keels and expert shaping came within the sphere of the Sa Tangaloa, the builders' guild. The builders built canoes as well as houses. In the mythical tales of the early meetings of the guild, with Tangaloa himself presiding, one of the subjects that came up for discussion was whether sennit braid (*'afa*) should be used first on a canoe or a house. It was decided in favor of the house and sennit braid was thus used on houses before the canoes. As the houses were the better type of house made by the Sa Tangaloa we may take it that the canoes were also the better types. The story would seem to indicate that the higher development of the house preceded the making of plank canoes. Cook houses, ordinary dwelling houses, and the simpler dugout canoes were beneath the notice of the Sa Tangaloa and would not, therefore, come up for discussion. The lashing of canoes with sennit braid must go as far back in time as there were coconuts to provide fibre so the historical discussion must have dealt with a special use that involved quantity and method such as is explained by the lashing of planks, and not the ordinary lashing of outrigger booms alone to ordinary dugouts.

The person desiring a better class of canoe had to approach a master builder with all the ceremonial preliminaries observed in house building. The canoe and the house were on the same level. The chief, therefore, mobilized his family and his resources beforehand. He planted food crops and collected fine mats for he had to feed and pay the master builder and his associates. Everything being ready, he approached the desired builder with a fine mat and over the ceremonial bowl of kava made his request and proffered his mat. The builder replied and if he accepted the mat, the contract was sealed. If he refused, the chief sought another expert with the rejected mat.

The builder on an appointed day arrived with his party, selected the timber and did the preliminary shaping whilst the chief's family did the rough work in transporting the timber from the forest to the village. The wood was allowed to season while the builders returned home. The wood sufficiently seasoned, the builders returned and dwelt on the hospitality of the chief and his family. All the general observances described in house building were carried out in canoe building. The builders had to be fed on the best of food with variety in delicacies or they abandoned the work which no one else would take up. A member of the chief's family had to be in constant attendance to show the respect evinced by an active interest in the work, as well as to anticipate the material wants of the builders. Interim payments had to be made and if they proved unsatisfactory to the builders, they left on the pretext that they had not been treated with sufficient respect.

Stair (33, p. 150) gives the five interim payments as follows:
'O le taunga. The fine mat at the first interview.
'O le oloa. At the laying of the keel.
'O le tao fanonga.
'O le sa. On the completion of the sides.
'O le umusanga. On the completion of the work.

According to Stair, the most ceremonial payment was on the completion of the sides of the canoe. The fine mats were divided up into six portions, and each portion was given with an appropriate speech for a specified reason.

'O afu i vao. The covering (*afu*) for working in the bush.
'O le solinga. The cutting of the timber.
'O le afu o le tufunga. The covering of the principal builder.
'O le afu o le ava. The covering of the builder's wife.
'O le si'inga o le taumua. The lifting of the bow of the canoe.
'O le salusalunga o le ta'ele. The rubbing smooth of the keel.

In house building, a similar enumeration took place at the final payment. Stair (33, p. 151) states that strange scenes were seen at the final payment.

The chief's family sat within the guest house and the builders sat outside in the open space before it. Women wearing the fine mats went out and then laid them before the builders. If not enough, the builders coaxed and threatened, saying the payment was inadequate and not what they considered in keeping with the rank of their employer. The chief pleaded poverty. The builders replied by asking why, if poor, he had presumed to employ them. If the chief produced some more mats, the builders were extravagant in their praise; if not, they were equally loud in their vituperation. However, the chief was at last in a commanding position for the canoe was finished and no strike could affect him. All that the builders could do was to return home and broadcast accounts of the chief's parsimony to all and sundry.

During the building of the canoe, however, the builders could adopt a rather mean way of venting their spite on a chief when it was not deemed advisable to go on strike. They could make the canoe, if it were a fishing canoe, unlucky. There were two ways of doing this. The lashings of the topsides or gunwale to the side pieces in a bonito canoe are called the *pu fangota.* The correct number of lashings as already stated are 15 on the right and 16 on the left. All the builders had to do was to change that number and the canoe would never catch more than ten bonito. This may apply only to Tutuila where it was told to me but it gives an idea of how simply a disaster could be brought on the man who was sparing of food and fine mats. The man who had reason to suspect the builders probably watched the drilling of the topsides very carefully. Even so, there was another method easily overlooked. In the temporary fitting of the side pieces, small wooden wedges, *tina* or *mata lafi,* were driven under the lashings to tighten them. In permanent lashings, these wedges were of course removed. All the dissatisfied builder had to do was to leave a temporary lashing with the wedge under it and the finest bonito hook could not overcome the evil influence of that one wedge. The wedge was left in a lashing under the bow or stern narrow part. When the bow or stern cover was lashed, the keenest-sighted owner could not locate the wedge. He found out afterwards from results or rather from lack of results.

In Savaii, I watched a master builder solemnly strike an unhusked green coconut against the bow piece of a newly-built bonito canoe, walk sedately around the canoe twice and as I waited with a camera until he struck it again sufficiently hard enough to crack it to make the contents flow, he cast it into the sea. He then pushed the canoe out into the lagoon and critically watched the set of the float and how the canoe rode in the water. The owner then waded out, got aboard and showed her speed to the admiring family gathered on the beach. Whether the coconut was a substitute for the bottle of wine of another culture, I was unable to determine. In spite of the head builder's

assurances to the contrary, I looked upon him as a biased witness. Besides, he was the man who said that stone adzes were hafted with the bevel surface in front.

HISTORY

Every person of any status had a bonito canoe. These went out in fleets during the season and sometimes in pursuing shoals got out a good distance. Bougainville, seeing a fleet of fishing canoes, looked upon the Samoans as daring sailors and thereupon called the Samoan group the Navigators Islands. The bonito canoe thus gave the people an unearned reputation. Samoan voyages were mostly confined within the limits of their own group with occasional voyages to Tonga and Fiji. As regards communication between Samoa and Tonga, it was the Tongans who made most of the voyages.

Samoan historical narratives are singularly lacking in detailed stories of long sea voyages, and present a marked contrast to the wealth of such material in marginal Polynesia. This may be attributed to the fact that the Samoans were early located in a group of islands sufficiently large to absorb their population. Many of the trips of Samoan legendary ancestors were accomplished by swimming, which shows how little pride they took in voyaging canoes, else they would have handed on more details of the form of actual transport. Stair (33, pp. 271-286) has described a number of long sea voyages which he attributes to Samoans but he rather naively explains that he got his information from a Rarotongan. In these narratives he takes all mention of Hawaiki as referring to the Samoan dialectical form of Savaii, and regardless of the many Hawaiki scattered over the Pacific, claims all the famous long sea voyagers of marginal Polynesia as Samoans. Stair, himself, states that the original Samoan double canoe was so difficult for them to handle that the Samoans abandoned it for the Tongan type with which they came in contact comparatively recently. It is significant that the two largest types of canoe, the *'alia* and the *taumualua,* were both adopted from foreign patterns. The Samoan evidently not only did not have the necessity for long sea voyages but he did not have a satisfactory type of large craft in which to make them. It is fair argument to suppose that he had not evolved a satisfactory type because, though he had an organized guild of canoe builders, he had not developed, or had lost, the voyaging instinct. There seems to be no material reason why he should have gone searching for land. Thus, both Bougainville and Stair have given the world a wrong conception of what the Samoans did with the canoes they had.

FISHING

GENERAL FEATURES

The waters within the bounding reefs provided the main source of fish so all important in furnishing the chief flesh food supply of the Samoans. These waters were combed over and over again and day after day in every conceivable fashion, from simple groping between the rocks with bare hands to skilled devices with traps, nets, and hooks. The habits and movements of various kinds of fish had been practically studied by generations of fishermen and the knowledge influenced invention and method. Method varied from the efforts of individuals to the organised cooperation of the community. The sphere of women was restricted as they were denied the use of the fishing canoe. The canoe took men outside the reef to seek the deep sea fish that came within the possibilities of their attainment. The deep sea fish pursued were the bonito, dolphin, shark, flying fish, and some that frequented the outer side of the reef. Of the migrating fish which entered the lagoons, the most important were the mullett and the mackerel. In fresh waters, the eel and fresh-water crayfish were obtained and the migrating fry of the *ingana* in two rivers of Savaii. Within the lagoon, marine foods such as seaweed, shell fish and the marine worm known as palolo added to the supply.

Groping. Both men and women are expert at groping (*naonao*) in the crevices between rocks for the rock-frequenting fish which rest there. The men often use the short spear but women use the bare hands, or nowadays a piece of cloth. The narrow clefts from which there is no escape are naturally productive of the best results. The constant search that commences in childhood naturally leads to the villagers coming to know every suitable cleft and crevice in the lagoon that adjoins the village. They submerge and with open eyes swim around the rocks peering and feeling in the crevices. When a fish is caught, it is brought up, the head bitten to kill it and the catch deposited in a basket of the *ola malu* type tied around the wrist or slung over the back. The groping method also accompanies the community fishing with nets as the people assisting in a drive simply cannot pass suitable looking rocks without diving down and groping amongst them.

Rock heaps. To furnish extra resting places to attract fish, rocks are piled up in heaps (*ma'a*) in suitable places within the lagoon. In Savaii, the lagoon is dotted with these piled heaps which are simply called *ma'a* (rock), or *fatuati*. Piles of branching coal (*'amu*) are also used and called *fatu'amu*. These form suitable places for simple groping. An improvement is the use by women of the *ola tu* fish basket. The basket is held open against a suitable part of the pile while women remove the stones gradually from the other side and by taking away the cover of the fish, drive them into the basket. The

basket is thus often referred to as a *fanga* (trap) from its use. At high tide men form a wide circle around the pile in their *paopao* canoes. They then paddle slowly in towards the pile, beating the sides of the canoes with their paddles or with the bailers to drive the fish into the pile of rocks. Each canoe has a light stone anchor which is thrown overboard as it nears the rocks. The men, armed with short spears, jump overboard and surround the rocks. The fish are speared as the rocks are removed. The method employs the largest number with the least results, as many of the fish escape. A better method is to surround the pile with a meshed net, throw the rocks outside, and leave the fish enclosed. After disarranging the pile of rocks in these operations, the stones are always heaped up again before leaving. The rocks used are the waterworn blocks of coral which are not very heavy. The *manini* fish which come in shoals in November are caught in piles of stones that are heaped up (*ma'a fa'aputu*). Sina brought the *manini* to Auala near Asau in Savaii. When the shoals come, the people drive them towards the stone heaps by throwing stones behind them. A net is then drawn round the heap of stones and the fish speared or caught in the net meshes as they try to escape. The *lo* are also chased into the stone heaps by throwing stones at them, which process is called *tilo lo*.

Sticks. Battering sticks are used in another form of fishing with the *ma'a* piles of rocks. People surround the rocks and work in towards them, poking and pounding the branched coral amongst which the smaller fish lurk. The process of pounding the rocks is termed *tu'itu'i,* and being associated with the *ma'a* piles is termed *tu'itu'i ma'a*. From the general process, the sticks are called *la'au tu'itu'i ma'a,* and for short the word *ma'a* is dropped. By this means the fish are driven into the *ma'a* piles and caught by groping, spearing, the *ola tu* basket, or the net. The method may also be used without the *ma'a* piles in parts where a plentiful growth of the small branched coral affords cover for fish. The *ola tu* basket is set across a convenient small channel and the coral pounded with the sticks by women usually, who work in a decreasing oval formation with the fixed small end of the oval at the basket. The branching coral is termed *'amu* and the method *tu'itu'i'amu*. The water is never above waist high during these operations. Both sexes are expert in floating over the sharp coral by paddling with their hands while the face is under water watching for fish. They rest on the stick or put a foot down here and there and by keeping their full weight off the sharp coral, progress quickly without needing sandals. To a foreigner progress even in boots is slow and fraught with danger from cuts about the ankles and legs which inflame and are slow to heal. Cuts from live coral take months to heal as they break down again and again, yet the Samoan constantly explores the sharp *'amu* patches with impunity even after sustaining cuts. His culture trains him from infancy to cope with the watery element. He paddles over sharp coral groves, swims

over deep holes and channels, and dives round rocks and crevices. A strong wave that would dash a stranger against jagged rocks is avoided by falling forward over it when the place is shallow and submerging quickly under it when the depth permits. Even a novice under water would be swept against a sharp rock but the native fishers of either sex give a turn of the hand or foot and head into recesses and under projecting points with an ease that defies wave and current. The success that attends methods that another culture would regard as primitive depends on the high standard of skill attained in progression, both through and under the water, and in dealing with the various changes within the lagoon. People without this skill would starve amidst plenty. Their futile attempts to secure food without the mechanical appliances of their own culture would be regarded from the Samoan standpoint as very primitive indeed.

The octopus stick (*sao fai fe'e*) about 3 to 4 feet long, and as thick as the finger, is used by women for drawing the octopus out of holes in the coral within the reef. At low tide, women may be seen prowling about the shallow parts of the lagoon looking into pools for likely holes. The *sao* stick for obtaining octopus (*fai fe'e*) is thrust down into the hole and twirled about. The irritation drives the octopus out, when it is quickly seized by the body and bitten between the eyes to kill it before it can get a grip with its tentacles. They are too small, however, to do much damage. I heard of a woman getting into trouble with a larger octopus than usual. When she attempted to bite it, the octopus got its tentacles around her head and neck. The woman's screams brought assistance. The rescuer said she presented a ludicrous sight with the writhing tentacles waving from her head like hair. Had the "Medusa's head" myth occurred in Polynesia, the moving tentacles of an octopus would offer a more rational explanation than writhing snakes. A second short slender stick about 18 inches long is often carried in addition to poke into awkward holes with a bend. The octopus, after being killed, is placed in the *ola malu* slung on the back. The octopus is a great delicacy much sought after. The *sao* method is used by women alone.

SNARES

Snares and nooses, which come under the term *sele,* are used to catch the sea centipede, fresh-water crayfish, and sea eel. A more elaborate rope noose is used as the orthodox method for catching shark.

Sea centipede snare (*sele valo*). The sea centipede (*valo*) is caught at Nuuuli, Tutuila, in a noose made with a strip of *alava,* the outer skin from the butt end of a coconut leaf. The sea centipede lives in holes in the beach which are burrowed out with a vertical entrance and then run horizontally under the surface. A hole is located and a long strip of flexible *alava* thrust down into it and worked along the burrow to indicate its direction. The sea centipede is

driven out as described in figure 253 *a*. As soon as its body is partly out of the hole, the man with the snare draws the two ends apart and thus catches the sea centipede in the knot.

Skipjack snare (*sele malauli*). At Asau in Savaii, where the four-ply round sennit braid was procured, a curious use for the braid obtained. Heaps of the branched coral were made to form a refuge for the small *penu penu* fish and thus attract the large fish called *malauli* by the Samoans and skipjack by the whites. (See figure 253 *b*.) The fishermen beat the sides of the canoes with their bailers and in this way, it is said, draw the *malauli* to the heaps of coral, where they pass into the crevices in search of the smaller *penu penu*.

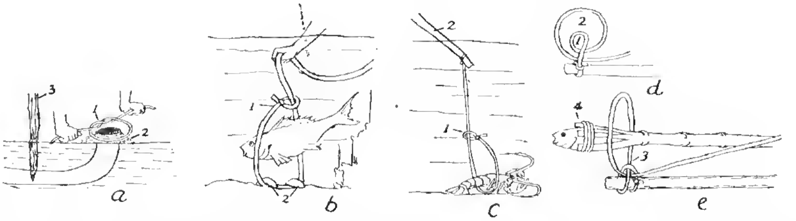


FIGURE 253.—Snares (*sele*) : *a*, sea centipede (*Squilla*). A piece of *alava* is formed into an open overhand or Staffordshire knot (1) adjusted to the size of hole (2) to rest around its circumference, while the two ends are held by the waiting fisherman. His assistant drives a pointed stake (3) down into the burrow on the line already indicated. As the beach is wet, the striking of the burrow is indicated by bubbles rising up. The assistant works his stick by succeeding thrusts along the course of the burrow until he succeeds in driving the sea centipede out through the entrance. *b*, The *malauli* fish. The fisherman forms a large loop with a length of four-ply braid (*fili anufe*) by passing one end around the running part and tying it around itself with an overhand knot (1). It is also advisable to tie another overhand knot on the end to act as a stopper knot and prevent the other knot from slipping off. The bottom of the loop is set near the coral heap and anchored down to the bottom with a couple of pieces of coral (2). *c*, Fresh-water crayfish. A thick fibre (*mui'a'a*) is picked out of the husk of a husked coconut, one end passed around the running end and tied to itself with an overhand knot (1) to provide an open loop through which the running part readily passes in opening out or closing the noose. The other end of the fibre is tied to a stick as a handle (2). The noose is lowered by the handle into the pool or stream and brought along behind the crayfish. It is gently worked along and insinuated under the tail. Once the tail is in the loop, the handle is drawn quickly up, and the crayfish thus caught by the tail. Much care is required not to startle the crayfish by any sudden movement. *d*, Sea eel. A wooden rod, 18 to 24 inches long, with a groove cut around one end is used as a handle. A cord of *fau songa* or sennit braid is tied around the groove and a short loop (1) is made by crossing on the far side of the fixed part. The cord forms a large loop (2) and again crosses the fixed part on the far side close to the handle and below the smaller loop (1). *e*, The short loop (1), kept to the far side of the large loop (2) is looped over the end of the stick to form a half hitch which is drawn taut by pulling the large loop at (3). The large loop (2) runs easily between the first tie and the half hitch and forms the snare. The bait stick (4) is formed of a thin piece of bamboo, about 2 feet long, split at one end into four segments between which the tail end of a small fish is stuck and the segments lashed around it with husk fibre or fau bast.

One hand may assist in keeping the loop open while the right holds the end near the small loop. The *malauli* swim about freely and brush against the men. When one passes into the loop, it is drawn taut. Holding the end and keeping the line taut, the fisherman jumps into his canoe and plays the fish. It was looked upon as great sport to let the fish tow the canoe. When tired, the fish was hauled into the canoe. The snaring of *malauli* thus partook of the nature of a game as well as adding to the food supplies.

Crayfish snare (*sele ula*). The fresh-water crayfish (*ula vai*) frequents pools in the various streams and is excellent eating. The snaring method is much used by boys and even adults as a makeshift method readily available. (See figure 253 *c*.)

Sea eel snare (*sele pusi*). Sea eels (*Muraena*), called *pusi*, are usually caught in a set trap but they are also caught inside the lagoon with a snare set on a wooden handle, while a separate bait is used in conjunction with it. (See figure 253 *d, e*.)

When a sea eel is located amongst the rocks in pools inside the reef, the noose is adjusted to suit the size of the fish. It must be larger than the fish, but not too large. The free end of the cord is then twisted around the fingers of the right hand; the handle with the noose is held in the left. Owing to the stiffness of the cord, the noose is easily adjusted to stand open at right angles to the stick. The bait stick, held in the right hand, is advanced through the loop to attract the eel. As the eel follows it up, the bait is withdrawn through the loop. The fish naturally follows and as soon as its head has passed through the loop, the cord is drawn taut by the right hand and the eel secured against the stick handle. (See Plate XLI, *A*, 1.)

SHARK NOOSE AND ITS USES

Shark noose (*maea noa malie*). The shark noose is made of full-sized sennit rope and, the noose being rather large for the term *sele*, the name is applied to the rope (*maea*) by which the shark (*malie*) is strangled (*noa*), hence *maea noa malie*. The older name for a shark was the universal Polynesian word *mango* but, according to tradition, it carried Sina over the sea so well that she thanked it (*malie*, to thank) and rewarded it with the agreeable name of *malie*.

The rope is made of strands of three-ply sennit braid but each ply contains as many as eight or nine strands of braid. When the rope has been twisted the further treatment in preparing the shark noose is as follows:

The loop is removed from the horizontal stake on which it was commenced and wrapped or seized with a strand of three-ply sennit braid to form a stiff open eye (*ai niu*). Commencing on one side close to the rope junction, the braid end is slanted in a direction away from the junction and held down on the strands with the left thumb while the right hand makes a turn round the strands to cross the braid a little distance from the braid end. The succeeding turns are placed as close together as possible and in the seizing,

the end of the braid is covered and thus fixed without any knot. To wrap round is *ta'ai* or *saloi* but the seizing of the rope is termed *matimati*. The *matimati* seizing is continued right around the eye. When it approaches the rope junction, a few firm figure-eight turns are crossed alternately around each limb until the temporary junction lashing prevents its further progress. The lashing is removed and the seizing with the continuous braid is carried on over the junction and along the rope.

Before continuing the seizing over the rope, however, further steps are taken to insure a smooth running noose. The rope is a thick three-ply twist with marked grooves between the plies. The three interply grooves are filled in (*fa'atumu*), each with a strand of sennit braid. Their ends are held in position while the seizing proceeds over them and fixes them. They follow the spiral grooves and are readily kept in their position by the left hand as the right makes the close transverse turns of the seizing. The rope that has to run through the eye is thus made perfectly round so as to run easily and at the same time the seizing stiffens it. The seizing is continued for the length required for the noose to accommodate the largest shark likely to be caught and then ended. In adding a fresh piece of sennit braid to continue the seizing, the ends of the old piece and the new piece are crossed in a slanting direction down the rope. The first turn of the new piece thus crosses over both ends, and subsequent turns, by covering both ends, fix them without any knot. In finishing off the seizing, three or four loose turns are made over the left thumb stretched along the rope and after removing the thumb, the end of the wrapping braid is turned back under the loose turns. Commencing with the turn next the seizing, each turn is drawn taut and the end of the braid pulled to remove the slack. The braid is then cut off back on the seizing where it emerges from under the first of the loose turns tightened.

Nowadays, shark nooses are usually made of bought rope of three-ply twist and one end is doubled back and spliced to form an eye. In Manua, the splicing is the much used word *so'o* (to join) and the eye is called *tali masanga* (*tali*, to receive; *masanga*, to act together).

A proper shark rope seen at Leone was 22 feet long and was seized for 5 feet from the eye. The rope was 0.85 inches in diameter. At the end, the strands had been divided into two lots and each plaited to form two smaller cords 20 and 44 inches long. The two smaller cords are tied around the rear boom of the canoe.

Shark nets are now rarely if ever used. Noosing, however, still remains the common Samoan method of catching shark. With such a well-established successful method, there was little incentive to use a hook. My Samoan informants denied the use of a hook and it is extremely doubtful if it was ever used. The wooden hook in the Dresden Museum mentioned by Beasley (1, p. 22) as being a Samoan shark hook was probably a hook for catching *masimasi*.

As the noosing method (*lepamalie*) forms such an extraordinary contrast to the method of using large hooks in marginal Polynesia, it is described here in detail. The shark was lured to the side of the canoe by means of rattles and baits.

Shark rattle (*tu'i ipu* or *lutu*). The *tu'i ipu* is formed of the discarded half coconut shells (*ipu*) that abound near the cooking house from the grating of coconuts. (See figure 254.)

There is no special care taken in making the rattles. Any shells and any suitable wood serve the purpose. They are used to attract attention by lowering the shells well down into the water and working the handle part violently up and down, care being taken to keep the shells submerged. A sound is made not by the shells clicking together but by the commotion of the water, caused by the cups being drawn up and down. The commotion in the water, according to the Samoans, conveys the idea to the shark that there is a school of fish about. As it swims in the direction of the sound, another of the shark's senses comes under the influence of the bait lures. When a shark is seen in the vicinity of the bait lures, the rattle is drawn up.

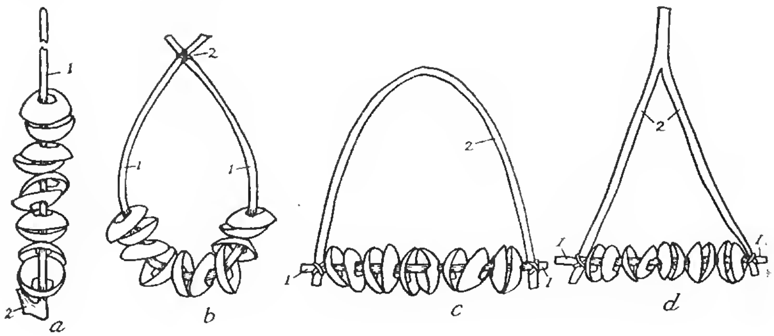


FIGURE 254.—Shark rattles (*tu'i malie*). Usually five pairs of half shells are choosen and any kind of hole knocked through the bottom with the end of a stick. These are threaded on a wooden handle or frame and faced as if they were five whole coconuts. The handles vary with the taste of the fisherman into one of four forms: *a*, straight handle in which a straight rod (1) about 4 or 5 feet long is selected with a hook formed by a cut off branch (2) at the bottom end. The hook prevents the bottom shell from slipping off. The handle must be long enough to give the fisherman plenty of length for working the lure up and down while the shells are submerged in the water. Models in museums are usually much too short and give a wrong impression of how violently the lure is shaken. *b*, Oval one-piece handle. The shells are threaded on a straight piece of green wood (1) which is bent around to cross the ends (2) which are tied together. *c*, Curved handle with crossbar. The shells are again threaded on a straight crossbar (1) to the ends of which are tied the two ends of a curved stick (2) which forms the handle. *d*, Forked handle with crossbar. The shells are threaded on a straight cross bar (1) to the ends of which are tied the two ends of a forked stick (2) which forms the handle.

Bait lures. There are three bait lures, the deep, the float, and the near baits.

1. Deep bait (*maunu tau lafo*). The deep bait is a bait of an old fowl or a piece of pork which is tied to a ten-foot rope and thrown overboard. It sinks down and when a deep-swimming shark is attracted to it, the bait is drawn up and the shark comes within the sphere of the near bait.

2. Float bait (*uto*). The far bait is tied to a wooden float called an *uto* and is thus referred to as *uto*. The upper surface of the float is flat and the

side edges, after running parallel for about half way, slope inwards to the middle line and run forward to form a projection about one inch wide. The under convex surface, after running forward at even depth, slopes upwards towards the projection which has a constricted neck. At the other end a wooden peg is driven into the end surface about 0.75 inches below the upper surface and the middle line. (See Plate XLI, *C*.)

A strand of sennit braid is run from the front projection along the middle line of the upper surface, around the posterior peg and back to the neck of the projection. It is looped forward and then lashed to the projection at the neck with the end of another long piece of braid. The long end of lashing braid is left on to serve as a bait tie. Round the curved surface of the float four transverse grooves are cut at fairly equal distances apart. Bait is tied to the mesial longitudinal braids opposite the grooves. Opposite the first two grooves at the pointed end dried bonito heads (*pa'o'o*) are tied, to the third a fish, and to the last a piece of pork. In these days when kegged beef is so much in favor, a piece of old salt beef may replace the pork.

The bonito *pa'o'o* bait consists of the head of the bonito from which the skull and under parts are removed, leaving the large opercula connected in the middle line above. (See Plate XLI, *E*.) These heads are dried and kept as they have a strong, powerful odor which attracts the shark.

The bonito bait is turned down and one side pushed through under the mesial braids so that an operculum is on either side of the middle line. The tie line is brought down the middle line, over the middle line, over the bait, turned to the left and passed around under the float to appear on the right side. From the right it passes to the left over the middle line and over its previous course, and after looping around the left operculum of the bait passes back to the middle line to take a turn around the mesial braids. The second bonito bait is tied in the same way, and then the other two.

The *uto* float is now baited, but another trailing bait (*maunu tafea*) is tied to a cord a foot long and the end of the cord tied to the float under the end of the mesial braids. The *uto* float bait is the most important in attracting the fish. A head fisherman at Papa, Savaii, stated that the following words were repeated as each of the four baits were tied on:

Fa'amata maiufi. Look O, Maiufi.
Fa'amata nai aso. Look O, Naiaso.
Fa'amata alava. Look O, Alava.
Fa'amata uluvai. Look O, Uluvai.

The four names recited are names of kinds of shark. The head fisherman at Salailua, Savaii, denied the use of the above in his district while tying on bait but said the following words were used when the *uto* float was thrown out:

Malie i sasa'e,	Shark in the east,
Malie i sisifo,	Shark in the west,
Malie i uta,	Shark inland,
Malie i tai,	Shark at sea,
Malie i lalo,	Shark below,
Fai uma latou taunga lena.	Gather all together, there is the feast!

The float is tied to a long rope and thrown out. A man watches it and reports any movement. Sometimes the bait is taken by a shark. When a shark is noticed making for or biting at the float, the float is drawn in slowly to draw the shark after it. When the shark gets close enough to the canoe to come within the sphere of the near bait, the float bait is drawn into the canoe.

3. Near bait (*maunu tautino*). The near bait hangs on a short line near the canoe (*tautino,* near the body). The purpose of this bait is to manoeuvre the shark into position for the noose. The bonito *pa'o'o* may be used.

Using the noose. The expert with the noose judges the size of the loop to suit the size of the shark that is now plainly visible near the canoe. He opens out the noose to the required size and, holding it at the eye by the right hand, he grasps the rope with the left hand not far from the right. The noose keeps open owing to the stiff nature of the sennit rope and the seizing. A manila rope is no good because it is too soft and the loop sags. The noose is lowered into the water with the hand above the surface and the loop at right angles to the canoe. The assistant manipulates the near bait so as to draw the shark which follows it into the noose. As the shark's head enters the noose, the expert's right hand carries the loop back until it touches the shark's dorsal fin (*tulangongo*). The dorsal fin is an anatomical landmark. The shark's lower jaw is set well back and the noose must not be closed until it is behind the lower jaw. Immediately the right hand touches the dorsal fin, the expert knows that the noose is behind the lower jaw, so he pulls the rope taut with his left hand while the right holds the eye of the noose firmly against the side of the shark.

An ordinary sized shark is firmly held in this position in spite of its struggles. It cannot possibly bite while so held. The right hand, by means of the noose, turns the shark's head upward and as soon as the nose shows above the surface an assistant strikes it with a club. If the shark is too strong, the fisherman has to let it go. He must choose the moment when the head of the fish is directed downwards. If he lets go when the head is directed upwards, the shark may snap his hand before he can get it clear.

A man of Safotu, Savaii, had his hand bitten off at the wrist through letting go at the wrong time. The boat came in immediately but as the crew were evidently ignorant of the value of the tourniquet, the unfortunate man died from loss of blood just as the boat reached the shore.

When the rope is let go, it must be held near the tied end to prevent the weight coming on the rear boom and thus snapping it. The shark is allowed to tow the canoe and thus exhaust itself. After a time, three or four sharp jerks will bring it to and cause it to float belly upwards. The shark is drawn in to the side of the canoe. The expert gets hold of the rope against the body very quickly and working his hands downwards on either side gets them into the gills. The head is then lifted up out of the water and an assistant strikes it a couple of blows on the nose with the shark club.

Besides carrying the rope noose and baits, each canoe carries a short club and many carry a wooden spear as well, as part of the shark equipment.

The shark club (*fa'apo*) is a short wooden club from 2.5 to 3 feet long and about 2 inches in diameter. They are round but, owing to the free use of steel tools, some of the more modern ones are four-sided. Heavy wood, such as the *manulenga* or *filofiloa* is used. The handle is usually shaped. The term *fa'apo* means to kill without the victim knowing.

The shark spear (*taova'a,* from *tao,* spear, and *va'a,* canoe) is made of some hard heavy wood, such as *filofiloa.* It is an ordinary strong stake about 6 feet, 6 inches long and sharpened at one end. If a large shark is caught in a noose and the crew becomes afraid, the spear is thrust into its mouth when it opens. The spear then serves as a gag and the shark is unable to bite. The fish being gagged, the crew have more confidence and the shark is played and despatched in the ordinary way. If the shark is too large to tackle, the spear forms a useful weapon with which to turn it away. A much-used shark spear seen at Papa had cuts all around it from the teeth of various sharks that it had gagged.

FLOATS

The use of the bait float in shark fishing has been described. Wooden floats are used with nets and the line of a squid lure. All are termed *uto.* A green branch tied to an eel line also acts as a float and is termed *fa'autouto* (to act as an *uto*). Two special floats are here described:

1. Flying fish float (*uto malolo*). According to Fepuleai Ripley, a particular bone in the flying fish (*malolo*) was tied to a line at an angle to form a crude hook. The short length of line was tied to a wooden float and the bone baited with a variety of coconut called *niu uto.* A number so prepared were set in line outside the reef and the fisherman watched from one end of the line. When a float moved out of line, he knew that a fish was on. He paddled down, removed the fish and reset the float in line again. The method was apparently unknown in Manua and Savaii yet Pratt (23, p. 300) gives *tangatanga* as the buoy of the bait for flying fish, *pangi* as the bait for flying fish and *panginto,* to fix the bait for flying fish. As *panginto* is compounded of *pangi* (flying fish bait) and *uto* (float) it is evident that the bait for flying

fish was fixed to the float. Pratt also gives the following saying: "Ua saluia le pangi." (The *malolo* bait is now visible in the morning light.)

The implication is that the secret is out. Ripley, to support his account which was derived from his father, quoted the saying: "E fano le malolo i lona au." (The flying fish perishes through its own sharp point.) He contended that *au* was the sharp bone used to catch it, which was obtained from others of its species. The saying was applied to anyone who brought trouble upon himself. I quoted the proverb in Savaii to talking chiefs but they did not know it. On returning from Savaii to Leone, I took Ripley a flying fish obtained on the passage over and asked him to pick out the bone and make the hook. He was unable to do so as he had never seen it done. He called in Le Oso, the senior talking chief of Leone, and laid the flying fish before him. But Le Oso was no fisherman. He knew the saying, however, and expounded it to cover up his ignorance of a lost fishing technique. The *au*, he explained, was the liver and it was the liver that was used as a bait to an ordinary hook and did not signify the bone at all. Inquiries about the kind of hook baited with the *au* failed to elicit a satisfactory reply. Ripley had the courage to stick to his statement but regretted his inability to make the appliance. The above is mentioned at length to show that correct information is not always with the older people. Some local method may be known to a family and transmitted to young men when older people with a wider knowledge of the past may be ignorant of it. Present Samoan evidence was against Ripley, and Le Oso's explanation of the *au* also accounted for Pratt's information which did not deal with the point on which the fish were caught. Fortunately the missionary, John Williams (43, p. 448), described the method of using the floats and in addition described the pointed fish bones used with the floats. They were used as gorges (p. 490) and Ripley is fully vindicated in spite of Le Oso and the ignorance of the method that prevails in other parts. Ripley thought the bone was tied in a slant to the line but it is not slanted until the bait is put on.

2. Net with Single Float. Kramer (18, vol. 2, p. 170) and Demandt (9, p. 54 figure a small net of the *'upenga sumu* type (p. 478) with a large *uto* float attached above the crossing of the four curved sticks which act as spreaders to the rectangular net.

TORCHES

Torches (*lama*) are made of the dry coconut leaflets (*au lama*) left out to dry in the sun. The leaflets are pulled off the midrib and tied together in small bundles. Torching goes on at night inside the reef. A number of the leaflet bundles are carried and as one burns down another is lit. The *taume* flower sheaths of the coconut palm when dry are also tied into a bundle termed *fausa* and used as a torch. Dried candlenut kernels, also called *lama,* are

threaded together and termed *tuingalama*. Both women and men use the torch.

Coconut leaves are used as an individual adjunct in the torch, to form the walls of temporary weirs and as sweep nets and dams in community fishing.

According to a saying the torch was used in catching the *sipa* outside the reef but no details were obtained.

COCONUT LEAF SWEEPS

The long leaf sweep (*lauloa*). The *lauloa* method of fishing is one shared by the village community and gives much enjoyment during operations. A long sweep is obtained by attaching coconut leaves to strong vines and, by means of it, fish are driven into a set net. A description of a *lauloa* sweep at Fangamalo, Savaii, will explain the method and also give an insight into how cooperation is secured in the village.

The matai heads of families meet together in one of the guest houses and over a bowl of kava decide to have a *lauloa* (*lau*, leaf; *loa*, long) which is the name given to the method of fishing as well as the means. The *tautai* or head fisherman is, of course, present and discusses the tide and time. The meeting decides that ten fathoms of leaf from each family will make a sufficiently long *lauloa*. The news is promulgated and the head of each family sends one of the young men (*aumanga*) to the woods to get ten fathoms of the *fue vai* vine. Others collect green coconut leaves, split them down the midrib and thin the midrib strips down. The young man returns with a coil of vine and throws it down in front of the family dwelling house. The family head ties a knot at one end of the vine and after measuring off ten full-arm spans, ties another knot. The vine is stretched waist high between two trees and the part beween the two knots filled in.

The end of the first midrib strip is passed through the left knot and doubled back. The midrib strip is then wound spirally round the vine and two or three close turns taken over the doubled-back end so as to bury and fix it. Every here and there, a leaflet is wound round and round both the midrib and the vine, and the end passed between them and pulled down. The subsequent windings of the midrib keeps the leaflet end against the vine and fixes it. The leaflet windings prevent the midrib strip from slipping. Just before the midrib strip ends, the vine is split (now with a knife), the end of the new strip is passed through the slit and doubled forward. The end of the shortening strip takes some spiral turns round the doubled forward new end and then the new strip continues its spiral turns over both of them and fixes them. The addition of fresh midrib strips is continued up to the second knot, when the end is fixed by passing it through the knot and tying it in an overhand knot. In Plate XLI, *G*, the leaflets are shown projecting out from the vine in all directions. The ten fathoms are then coiled and left for the assembling on the morrow. Each family has its ten fathoms in waiting.

The *lauloa* is worked in conjunction with a meshed net of cord set in the channel. The head fisherman and a few assistants set the net which has two wings forming a "V" with a bag or purse at the junction of the arms. The net has a top rope with wooden floats while the bottom rope is weighted down on the bottom with large stones picked up in the vicinity. The two wings of the net are further lengthened on either side by banana leaves tied to a vine. The vine is weighted down while the banana leaves float vertically,

forming a fence. Though fish may easily pass between the banana leaves and the leaflets of the sweep, they will not do so owing to the movement of the leaves. They pass on into the wings of the net and always make for an opening while there is one. (See figure 255 *a*.)

While the set net is being attended to, all the leaf sections of ten fathoms are assembled on the bench, each section being called a *fanganiu*. Instead of being loaded onto various small canoes, the presence of a large whale boat enabled all the section to be loaded in one vessl. The boat with its freight of leaves and men is pulled across to the reef at 4 P. M. at some considerable distance from the set net. The first section is dropped overboard after tying an end to another section. Some men seize the other end and carry it out on the reef to the highest dry part, just within the breaking of the sea rollers. This is to prevent any fish escaping between the end and the reef. The boat then pulls slowly back in a curve paying out the leaf, which has the sections joined together in the boat as fast as they are being paid out. (There is always a clear piece of vine at each end.) The ends are drawn together to join up the leafy parts and the vine is tied in a reef knot. The second in command superintends the paying out and giving directions. He is assisted vocally by everyone present. The men and women of the village appear as by magic all along the proposed course of the *lauloa*, which they judge by the movements of the boat. Men jump off the boat to take up positions behind the *lauloa* as it is paid out. The leaf is paid out in a long curve and the shore end is carried forward to the level of the reef end. The two ends are dragged forward towards the wings of the set net and the people evenly spaced along the intermediate part push their part forward in the general advance. Most people carry a pole with which they beat the water or rest on when in parts of the lagoon that are deeper than usual. The *lauloa* is drawn on a falling tide setting towards the open wings of the set net. Thus, by shaking leaves, and shouts, and laughter, the fish are driven forward towards the net. When at the right distance, the two ends of the leaf chain are converged towards the ends of the banana leaf wings. As the line of *lauloa* contracts inwards the slack is doubled along the margin to reinforce the line in the event any fish are frightened back. The contracting movement is continued until the leaf is closed right up against the wings of the net. By this time all taking part have crowded together, anxious to see the catch. All the fish having been driven into the net purse, the opening of the purse is constricted with the hands. The purse with its load of fish is lifted bodily up into the head fisherman's canoe, which is anchored alongside. The end of the purse is unlaced and the catch emptied out. There is time to draw the *lauloa* only once on the tide. The fish are taken ashore and subsequently divided amongst the families who had contributed their sections to the *lauloa*.

Short leaf sweep with mat cone (*tu'i.*) The *tu'i* variation of the *lauloa* was described to me at Salailua, Savaii. The receptacle to receive the fish is made of *fala* floor mats contributed by the village. The mats are stitched together to form a cone (*tu'i*) and used in conjunction with two sections of coconut leaf sweeps. (See figure 255, *b, c.*)

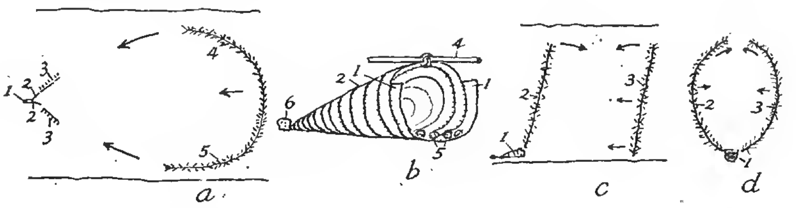


FIGURE 255.—Coconut leaf sweeps: *a*, the *lauloa* coconut leaf sweep with winged net. The purse net (1) with its wings (2) spread is set in the channel with the extensions (3) of banana leaf (*lau fa'i*). The coconut leaf sweep (4, 5) is carried along in a curve in the directions of the arrows to meet the banana leaf extensions of the set net. *b*, Leaf sweep with mat cone (*tu'i*): side view of (*tu'i*) cone made of from 50 to 200 floor mats sewn together with sennit braid for which holes are pierced through the overlapping edges of the mats with a pointed stick. The mats at the entrance (1) are turned up at the sides but do not meet above. Further back they meet (2) and are sewn together to form a closed cone. A sennit loop is attached above where the closed part commences to support a pole (4) which is held up to keep the entrance opening patent. Stones (5) are placed on the bottom of the entrance (*mata niu*) to anchor the cone to the bottom, a stone (6) tied to the end of the cone to keep it straight is termed a *taula* (anchor). *c*, The mat cone (1) is set close to the shore, a leaf sweep (2) with one end stationary on the outer side of the cone is stretched out towards the reef. A second leaf sweep (3) is stretched some distance away, parallel with the first and with its near end reaching the shore. The first sweep (2) pivots on its stationary end and the two sweeps move in the direction of the arrows until the outer ends meet. *d*, Leaf sweep with scoop net for *i'a sina*: the *'enu* scoop net (1) is set; two leaf sweeps (2, 3) with one end stationary on either side of the net are swept around in a curve until the outer ends (*taiao*) meet when they are tied together (*soso'o*), the curved sides are brought together (*fo le lau*), and the fish driven into the net which the expert in charge lifts (*ta 'enu*), empties into a basket and sets again for the process to be repeated. The leaf sweeps used are short ranging from 6 to 12 fathoms in length.

The outer ends of the sections of coconut sweep are termed *taiao* or *taiulu*. The section which reaches to the beach is termed *taiao fonua*. As before, the chief fisherman is in command at the receiving (*tu'i*), while the second in command superintends the sweeping in of the ends. The two sections of leaves are dragged until the outer ends meet. The command, "Soso'o taiao'" (Join the ends), is given and the outer ends of the two sections are brought together and tied. This tie is never unfastened. The people call, "Ua soso'o" (They are joined). Then comes the command, "Talai lau, fai tua fa" (Unknot the leaf, overlap to four thicknesses). The small individual sections are unknotted as the sweep narrows in and sections are overlapped to four thicknesses. As the area further diminishes the slack is taken in on subsequent

commands to six and eight thicknesses of overlap. The people support the sides of the *tu'i* as well as the narrowing *lauloa*. Women armed with scoop nets may catch any fish as the leaf sweeps close in. When closed right in, the unroofed front part of the *tu'i* is raised as a flap to close the entrance. When fish are plentiful, the chief fisherman may order the scoop nets to be used in scooping fish up into the canoes. If the *tu'i* can hold all the fish, poles are passed under it and the whole mass lifted up and carried ashore.

Short leaf sweep with scoop net. At Salelolonga, Savaii, two short sweeps (*lau*) are used to drive shoals of *i'a sina* into a scoop net (*'enu*) managed by an expert. The short sweeps from their particular use receive the name of *lau i'a sina*. They are a modification of the long *lauloa* sweep, adapted for a particular shoal fish and employing fewer people. In the same district the *atule* is caught similarly. (See figure 255, *d*.)

LEAF WEIRS AND DAMS

Leaf weirs (*tupa*), v-shaped, with walls formed of coconut and banana leaves, are used in Salelolonga, Savaii. They are called *tupa* and though they belong to the weir (*pa*) class, they are now described from their being a stationary form of the short *lau* methods used in the same district. Two weirs, facing in opposite directions, are set close together for the reason that the *i'a sina* fish, for which they are made, move in shoals towards the east in the morning and towards the west in the evening. Of two such weirs seen, one was made of coconut leaves and the other of banana leaves. (See figure 256.)

The *'enu* scoop net with a rigid frame is a little over 2.5 feet wide and fits against the stones on either side of the narrow *muli* openings of the weir. The stones give definite landmarks for the net to rest against, and also form a more natural opening for the fish to turn into the net. Though the leaves and leaflets of the walls afford ample space to pass through, the fish keep on so long as there is a clear opening in front. The weir bottom consisted of a hard, sandy surface and the *i'a sina* swim close to it. Hence, though the tops of the leaf walls may not reach the surface, the efficiency of the weir is not affected.

With the *'enu* net in position, the fisherman stands beside it on the outside of the weir, holding a cord attached to the lower crossbar of the net opening. When the fish that have entered the weir are forced into the net by the converging walls, the fisherman lifts the opening of the *'enu* with the cord. The fish are quickly removed into an *ola* fish basket tied around the waist, and the net is reset. The process continues until the fish cease to run.

For the morning run from the west, the fisherman must be at the weir before daybreak, as by 5:30 A. M. the fish cease to run in any number. For the run from the east, the right time is at sunset. There is no significance

between the banana and coconut leaf material except that the banana leaf forms the neater weir while the coconut one is easier to make.

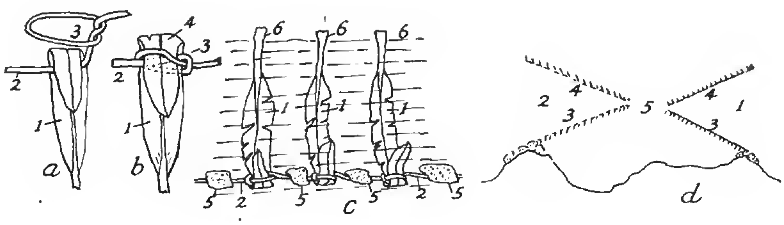


FIGURE 256.—Leaf weirs and their technique: *a*, the banana leaf weir (*tupa laufa'i*) is made of banana leaves tied to a *fuevai* vine by their tip ends. The tip end of a banana leaf (1) is doubled over a vine (2) and an open overhand knot (3) made on the vine just beyond the leaf; *b*, the open knot is slipped over the doubled end of the leaf (4) and the knot (3) drawn taut; *c*, a number of leaves (1) are fastened along the vine 16 to 24 inches apart, short lengths of vine are used to save trouble with the knots, the shorter lengths are united by reef knots until a length of 20 yards is obtained. The connected vine is laid on the bottom of the lagoon in the line of the weir and anchored at intervals by large stones (5) placed on the vine, when the leaf stalks (6) float up to the surface. *d*, The weir (1) facing west has two walls of banana leaves, each 20 yards long. The site of the small opening (*muli*) is selected and the near wall (3) run to a rocky point on the shore to prevent fish passing between the shore and the weir, the outer wall (4) is commenced at the *muli* end 2.5 feet from the end of the other and inclined outwards so that the outer opening is about 30 yards wide. The second weir (2) facing east, is made of whole coconut leaves, the lines being decided on as in the case of the first weir, two or three leaves placed together are laid in the line and anchored by large stones placed on the leaflets of one side; sets of leaves with their ends overlapping are continued for the 20 yards lengths of the walls; the midribs and free leaflets float upwards and establish the leafy walls (3, 4). The *muli* end in each weir is 2.5 feet wide and a large stone is placed on either side of the narrow opening; the coconut leaf weir (*tupa launiu*) with its large opening facing east, intercepts the shoals of fish as they move west in the evening, while the banana leaf weir intercepts them in the morning.

Dams (*puni*) are made across tidal inlets or estuaries of streams where the water is not too deep at high tide. The materials used are *laupola* sheets made from coconut half leaves in the same manner as the *laupola* thatch sheets. Stakes are driven into the muddy bottom three feet apart and in line, at low tide. The method is a community one. The leaf sheets are plaited and collected but the dam is not made until high tide to allow the fish to come up in search of food on the incoming tide. The dam is then made to intercept them on their return on the falling tide. The leaf fence is formed by tying the sheets to the stakes, there being perhaps three tiers of sheets to get a sufficient height.

A trap also termed *'enu* is used in connection with the dam but it differs from the Savaii *'enu* in being made of *'ie'ie* (*Freycinetia* vine). It has a trap entrance, which prevents the fish from getting out and can thus be left in position without personal supervision.

Openings called *fa'atoto'a* are left in the dam corresponding to the width of the trap. As many openings are made as there are traps available. If there is a good run of fish the traps may be visited by attendants who empty and reset them. Large traps made of *tuafanga* vine, may be left in position and the catch gathered after the tide has fallen. The dams are of two forms. Both types are used at the villages near Mulinuu in Upolu, where mangrove reaches abound.

1. The long dam (*puni loa*) is used between the two points known as Lominga and Tiaseu-ngongoa. The *puni loa* is a large community undertaking shared by the neighboring villages, which all assist in erecting the dam. The side *'enu* (Pl. XLIII, *E*) is used and the gathering is social as well as food-collecting.

2. The short dam (*puni mata tongo*) is a smaller family affair erected across smaller stretches of water as in the mangrove estuary at Vaiuso. As the dams stretch across between the mangroves (*tongo*) and the spaces between are likened to the meshes of a net (*mata*), the dam gets the name of *puni mata tongo* (to dam the spaces between the mangroves).

A saying is used in connection with the two dams, which indicates united action: "Puni loa, puni mata tongo." (The long dam and the short dam.) It really means that the wide spaces and the narrow spaces must be thoroughly dealt with.

LURES

Man lures fish to their destruction by deceiving them with actual food or some imitation of food. Food, when it encloses a gorge or hook or is itself enclosed in a trap, is a true bait for it forms a connected part of the apparatus which secures the fish. Baits used with the sea eel snare and the shark noose are true lures for the fish are drawn into the nooses by the baits which are moved and are not attached to the noose part of the apparatus. The wooden float and the *pa'o'o* dried heads are used only as lures. The coconut rattle imitates the sound of food in the form of splashing fish and thus lures the shark to its vicinity.

The shell hooks for bonito and other fish which are trolled are really lures for they are made to imitate small fish and thus lead to larger fish swallowing them. As, however, they have definite points connected with them, they come directly under the heading of hooks. In a certain form of a trap, a black stone is used to lure the fish into the trap. The above lures are all used (except the shell hook) in connection with something else. The appliance, however, used in catching squid has neither hook nor bait and constitutes a true lure.

Squid lure. The squid lure (*pule ta'i fe'e*) is made of a dark basaltic stone shaped like a spinning top (*ma'a ta'i fe'e*) with two plates of a marine

shell (*Cypraea tigris*) fitted to one side and a long strip of coconut root bearing pieces of coconut leaflet attached to the other. The lure is dangled and jerked about in the water from the end of a line and attracts the squid. The name of the shell is *pule*, the squid, *fe'e*, and to attract is *ta'i*. The compound name of the lure, *pule ta'i fe'e*, thus means the shell which attracts the squid. For the technique see figure 257.

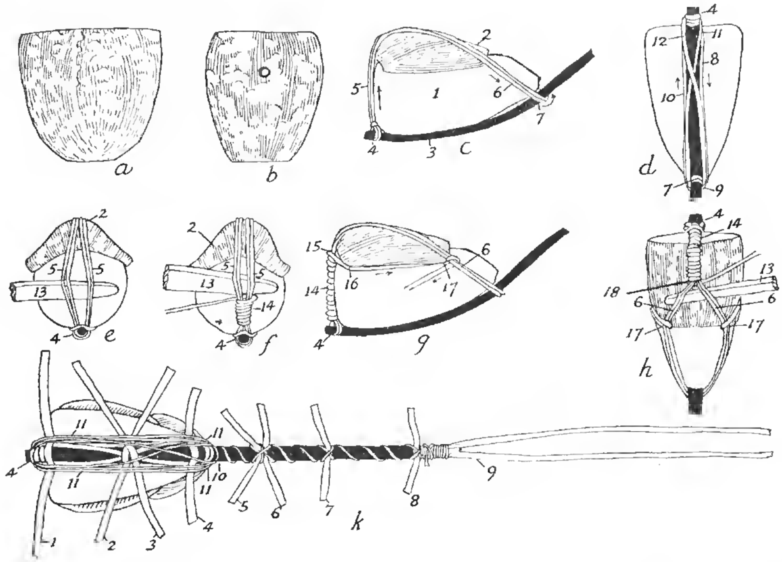


FIGURE 257.—Technique of squid lure (*pule ta'i fe'e*): *a*, first piece of shell (*pule fao*): cut to shape, 56 mm. across front widest part and 54 mm. from front to back; *b*, the second piece of shell (*pule fafa*), 48 mm. wide at front edge and 55 mm. from front to back, with hole drilled through in mesial line; *c*, the stone (1) shaped like a spinning top 85 mm. long is laid horizontally, the base which forms the front is not quite circular with a shorter vertical diameter of 40 mm. and a wider transverse diameter of 49 mm., the *pule fao* shell (2) is placed above with its concave edge slightly overlapping the upper circumference edge of the base of the stone; a piece of coconut root (3), 217 mm. in length, called the *tuasivi* (backbone) is placed longitudinally under the stone with one end projecting slightly beyond the base; a piece of braid about 6 feet long is tied with a running noose (*fa'amata sele*) around the short front end of the stick (4). Holding the shell, stone and stick together with the left hand, the right hand brings the braid vertically up the middle line (5) of the base of the stone and over the shell to pass along the middle line towards the point of the stone. Before reaching the point, the braid turns off to one side (6) and makes a complete turn (7) around the stick below the point of the stone. The braid is brought up on the other side of the point to rejoin the first part of its course and retrace its way back along the middle line over the shell and down the base of the stone to take a turn around the front of the stick (4). The course to the point of the stone and back is repeated. *d*, Under surface. The braid now makes a horizontal turn (8) under the stone by passing from the front end of the stick (4) along one side of it to the point of the stone where it passes transversely over the stick (9) and behind the previous turns (7) around the stick. It returns on the other side of the stick (10) to the front where it crosses above the projecting end. Two further turns are made on the under surface but they cross diagonally (11, 12) over the stick. *e*, The next step is to

tighten up the braid turns with the assistance of a flat wooden (*tina*) wedge with a laterally spread blunt point. The wedge (13) is inserted transversely under the turns (5) on the base of the stone to lift them up sufficiently to allow the end of the braid to pass under. *f*, The braid is passed under the vertical strands (5) and close wrapped turns or seizing (14) are commenced from below. The wrapping technique is termed *a'ao loloa*. *g*, Side view. When the seizing (14) reaches the edge of the shell (15), the braid is run outwards along the front edge and along its side edge to reach the back angle of the shell (17) where it passes over the two dorsal longitudinal turns which were diverged to the right side (*c*, 6). It passes around the two strands (6) and pulling them back to the angle of the shell (17), it retraces its course back to the vertical strands at 15. The braid takes a turn around the vertical strands and then repeats the lateral turns on the other side. The original dorsal turns are thus braced from the sides and further diverged from the mesial line; the side braces are termed *a'ao sa'o*. *h*, Upper surface. The mesial seizing (*a'ao loloa*) is continued over the edge of the shell and continued down the mesial dorsal line to brace the divergent pairs (6) back into the middle line. The *pule fao* shell is lashed immovably to the upper part of the stone and the stick below without any chance of slipping. The point (18) where the seizing stops is determined by fitting the second *pule fafa* shell with its narrow back edge resting on the stone near its point when the seizing stops at the front edge of the second shell. *k*, Under surface. The second shell has been fixed with a hinge joint by passing the braid through its hole from above and bringing it back beneath the shell to the right side of the mesial seized braid. It passes under the mesial braid to the left, back over the shell, down through the hole and back under it to the left side of the mesial braid. One or two more similar turns may be taken through the shell hole and after a couple of turns around the mesial braid, the lashing is fixed with a half hitch. A neater finish is made by a few seizing turns around the longitudinal turns on the upper surface of the second shell and then fixing with a half hitch; the lure is complete except for the leaflet attachment to the stick.

A long thread or sennit fibre is attached to the front of the stick (4) and four strips of coconut leaflet (1-4) are laid across the stick on the under surface of the stone as shown, the middle two being crossed diagonally. The thread is passed backwards and forwards over the stick behind the stone point (10) and the front end (4) in a series of diagonal and longitudinal turns (11) to keep the leaflet strips in position. The thread is wound with a loose spiral around the projecting rear end of the stick and the leaflet strips (5-8) are fastened in the positions indicated by two crossed turns. At the end of the stick, two long leaflet strips (9) about 6 inches long are attached by a few transverse turns ending in half hitches. The leaflet strips are 0.2 inches wide and project for 2 inches on either side of the stick. The strips receive names from the positions in which they are lashed as follows: 1, head lashing (*fausanga ulu*); 2 and 3, inside lashing (*fausanga loto*); 4, tail lashing (*fausanga i'u*); the strips on the stick alone are termed companions (*angai*) of the previous lashings but (5, 6) being crossed is the companion of the middle crossed pair (2, 3), while the far away strip (8) is the companion of the head lashing (1) and the remaining strip (7) is the companion of the tail lashing (4). The last tail piece (9) is termed *si'u si'u*.

A six-foot length of twisted cord or five-ply sennit braid is attached to the lure by passing one end under the wrapped median braid on the upper surface of the first *pule fao* shell by means of the *tina* wedge and then tying an overhand knot at its end. This is the orthodox fixation and no matter how the lure is jerked, the knot will not slip out from under the median braid.

A float (*uto*) made of light wood, shaped like a playing top, is drilled longitudinally from the center of the base to the point. The other end of the cord or braid is passed through from the point end and tied with an over-

hand knot to prevent it from slipping back. The top-shaped float is 2 inches in diameter at the base and 3 inehes long. (See Plate XLI, *B.*)

Lure fishing is used only by men, just as the stick method is used only by women. The women's method takes place at low tide and lure fishing inside the reef when the tide is in. The lure is used from the small *paopao* dugout canoes. The fisherman paddles baekwards and forwards in the likely parts of the lagoon. Whilst fishing he keeps the canoe moving by paddling with the left hand while the right manages the line of the lure. The lure is lowered to just above the bottom whieh is elearly seen and kept in motion by constant jerking, whieh is the movement that first attracts the attention of the squid. When it is jerked violently about, the lure looks ridiculously like a rat in the eonvulsions of drowning. The sharp jerks also cause the loose second shell to eliek against the stone and is supposed to represent the squeaks of the rat. That the squeak is not really neeessary is shown by the Hawiian lure whieh has no similar meehanism. The length of line is altered as the water shoals or deepens. Hence, the wooden float is never used as a hand grip.

When an oetopus sees the moving lure, it reaches out one tentaele and rests it on the lure. The fisherman who watehes his lure in the clear water, draws its steadily upwards. As it nears the surfaee, the oetopus whieh follows it up still with only one tentacle on it, probably realizing from the inereasing light, or lesser weight of the water that it stands a chanee of losing whatever the lure represents to it, suddenly pounees on the lure, rests its body on it, and elasps its tentacles around it. This is the psyehologieal moment when the fisherman draws it quickly out of the water and into the canoe. The octopus is seized by the body and bitten between the eyes, to kill it.

Small squids are ealled *ano.* A large oetopus ean best be managed from a eanoe in deep water where it eannot rest some of its tentaeles on the bottom. In shallow water they are dangerous as they ean draw a canoe under. A skilled fisherman if he gets a large oetopus on the lure will try and draw it out into deeper water and then pull it into the canoe when it is as suseeptible to a bite between the eyes as the smaller ones. If he eannot get deep enough water, he drops his line. When the lure beeomes motionless, the oetopus leaves it. The fisherman reeovers his line by means of the wooden float and thus saves his lure.

Pratt (23, p. 154) gives *la'ci* as a squid lure made of ti leaf. The lure is the same as that deseribed, but ti leaf strips are used instead of coconut leaflets to deeorate the under part with legs and tail. Aceording to the Safune people (Savaii), the squid has a praetieal aequaintance with botany. Henee, when in season, green young leaves must be used, but in the fall, the older leaves take their place. They maintain that it is the leaf strips, especially the tail leaves (*si'usi'u*) whieh attract the squid.

LEGEND OF THE FE'E AND THE RAT

The Tutuilan tale states that the *unga* (hermit crab), the *ve'a* (rail) and the *isumu* (rat) planned a visit to see the red earth cliffs, Lenga-a-Taema, near the western end of the island. The three friends lived between Aoloau and Fangamalo. Owing to the hermit crab being a poor pedestrian, they decided to journey by sea. The rat climbed a coconut tree, gnawed through the stem of a nut and dropped it to the ground. The crab husked it with his claws. Difficulty occurred with regard to splitting the nut open. The crab selected a tree leaning out over some rocks and climbing up with the nut dropped it on the rocks below. The nut split into two halves and the rat and the crab cleaned one of them out to provide the means of ocean transport. The craft was launched and the three comrades embarked. The rail spread out its wings as a sail whilst the crab and the rat kept the masts fixed by holding the rail's legs. With a fair breeze, they sailed merrily along towards Poloa, but between Fanga-lii and Poloa, they were struck by a hurricane (*afa*). As the craft foundered, the rail flew away to the land, the crab sunk to the bottom where it was quite at home, but the unfortunate rat was left swimming for its life. As it struggled with the waves, the rat lifted up its voice in lamentation as follows:

Ua lele le ve'a, e fai ona apa'au	The rail has flown because he has wings,
Ae ngoto le unga i le a'au, a'o a'u nei ua 'au'au.	The crab has sunk to the reef, but I, alas! have to swim.

The octopus (*fe'e*) hearing the rat's wailing, took pity and invited the rat to sit on his head whilst he conveyed him safely ashore. On the journey, the rat defaecated on the head of the *fe'e* without the latter knowing it. When safely ashore, the ungrateful rat taunted the octopus by drawing his attention to the insult. The enraged *fe'e* could not pursue the rat on land but vowed if ever he caught the rat in the water again, he would avenge the insult.

The hate of the *fe'e* has become hereditary and man his utilized it to his own advantage by shaping and decorating a lure to represent the rat. In the story from Savaii the *tuli* (plover) takes the place of the rail.

FISH SPEARS

Fish spears were made of a hard wood, such as *toa, pangi, asi,* and *'o'a.* The points were shaped and hardened in the fire. Three types were described but there may be others. The general name for spears is *tao.*

The one-point spear (*tao mata tasi*) was made in one piece. The handle was short so that the spear could be easily manipulated under water when used by men diving around the rocks and *ma'a* piles. It is now replaced by the short spear with an iron point.

The three-pointed spear (*tao mata tolu*) was a composite one, the points being made of any one of the hard woods mentioned above while the handle or shaft was of any light wood. The points were arranged with a spread and lashed to the shaft with sennit or twisted cord. This spear is better for thrusting or throwing at fish. Judd (17, p. 64) mentions seeing men swimming beyond the reef near Fitiuta and fishing with spears. Parts of the coast here are rocky, without channels, and hence unsuitable for launching canoes. The men therefore swim out armed with a spear and a basket. Only people

at home in the water could use such a method. The wooden points have been supplanted by iron.

The many-pointed spear (*tao fuifui*) gets its name from the cluster (*fuifui*) of points lashed to a handle (*fuata*). The points are *ala'a* hard wood but *olosina* may be used. (See Plate XLI, *F*.) The handle is of the soft *fu'afu'a* wood, but *milo* is preferable. The thick end of the handle is tapered down and four pieces placed round the end. About five turns of sennit braid are taken round them and the other points gradually added to the handle in spiral fashion, the turns of the braid being continued round them. When 33 points have been added, the turns are continued down the handle for a short way and then fixed by passing the end back under three or four loose turns, as in the hafting of adzes.

The spear is used for throwing into the midst of a shoal, such as the young mullet (*aua,* but *'anae* when they are full size).

BOW AND ARROW

The bow and arrow method is used for shooting at fish which swim near the surface. The arrows have two or three points of hard wood which are lashed to a shaft of cane (*u*). The bow is not used merely as a pastime but as a serious method by adult men. In Fitiuta, a bow and some arrows were seen hanging up in a house, so the sport still lingers in this remote village. The bow and arrows are similar to those used in shooting at pigeons and will be described on page 530. Arrows pointed with umbrella ribs brought to a sharp point are used by boys who shoot down on the fish from cliffs or a canoe.

SCOOPS

Various forms of scoop nets are referred to on page 476. There are, however, two forms of marine food which swarm in shoals at particular seasons and which are gathered in scoops not made of ordinary netting. The two foods are the palolo and the *ingana,* a small fry which corresponds to the whitebait of other countries.

Palolo scoop. The palolo swarms to the surface in myriads and all that is required is some form of scoop to dip them up out of the water. Children scoop them up with their cupped hands and empty them into a receptacle made of a sheet of the *lau'a'a* coconut fabric from the base of the leaves. The sheet is doubled, folded at the ends, and tied with a strip of bark. The little basket (Pl. XLI, *D*) is simply termed *'a'a* from the material.

The palolo though long are very thin. The problem of making a fine enough mesh in netting was evaded by the Samoan who sought a substitute in other material. Two types of scoop were made and both are called *'enu.*

The term *'enu* is thus rather general as it applies to some forms of net scoops and also to certain forms of traps.

1. Coconut fabric scoop (*'enu lau'a'a* or *taepa*). The fabric-like *lau'a'a* forms a convenient material as it is already fashioned by nature. In Savaii, it was made into a basket-like receptacle on a larger scale than the children's *'a'a*. An alternative name for this form in Savaii is *taepa*. Kramer (18, vol. 2, p. 170) figures a deeper form.

2. Coconut leaflet midrib scoop (*'enu tuaniu*) is a much better article. It is also figured by Kramer (18, vol. 2, p. 170) and shows midribs made into a cone by rows of single pair twining. A handle is also provided. Edge-Partington (10, vol. 1, no. 3, p. 77) figures a similar scoop.

Both forms of scoop are no longer in use as thin gauze or scrim can now be easily secured from the traders and made into scoop nets which are better or just as effective. At Tau, where the "palolo night" found me, my host's family had enough gauze from medical supplies to equip them, and as everybody else was similarly equipped, one looked in vain for the old time scoop nets during the fishing operations. The only ones who retained the old culture were the children who, failing to secure some gauze, still used the cupped hand scoop.

The palolo consists of the reproduction segments of a sea worm (*Nereis*) which are freed by the adult whose head end remains in its habitat at the bottom of the reef. The palolo comes wriggling up to the surface in immense quantities on certain parts of the coasts throughout the group, on the last night of the second quarter of the moon, or the following night in the months of October and November. If they appear in quantity in October there may be little in November, and if the supply fails in October, the Samoans look forward with confidence to November. In 1927 they appeared at Tau on October 17th just after midnight. The moon which was at the full rose at 2 .A.M. and after that the palolo disappeared on Tau. On Tau, palolo catching thus takes place between midnight and the rising of the moon. This corresponds with full tide and the rising of the moon coincides with the tide going out and thus carrying the palolo out to sea. They were caught by using the scoops close to the shore as the waves brought them in. The fishing ground was restricted to a small stretch opposite an opening in the reef. The catch was small and was not much better the next night. The November nights were also poor.

On the "palolo nights," they appear earliest in the east at the Manuan group. From Tutuila westward the hour of appearance is progressively later until at the western extremity of the chain, Savaii, they appear at sunrise, where they are caught in daylight. In Manua, one works in the dark with the aid of coconut torches or the modern electric torches.

A night or so before the palolo appeared an old man stated he could

smell the *pua palolo,* a peculiar indefinite reef smell that is supposed to get very strong immediately preceding the appearance.

The *palolo* seen were in two colors; green and brown. Cooked, they form a greenish unappetizing mass which, however, has a characteristic salty taste which is quite palatable. Palolo is greatly esteemed by the Samoans. Chief's palolo is cooked with coconut cream. Some is laid aside and recooked again and again with more coconut cream so that it is not only kept preserved but increases in size. With this treatment it is kept till the next season when it is eaten and fresh chief's palolo made.

The palolo season is of importance in the Samoan calendar and some of the months are referred to as before and after "palolo."

The whitebait scoop (*fonoti*) is made of sennit three-ply braid with the same technique as the sennit baskets already mentioned. (See Plate XLII, *A.*) Though the sennit basket technique is lost through disuse the sennit scoops are still made at Ngataivai and neighboring villages on the south coast of Savaii. The scoop is made like a satchel with one end left unclosed. Two sticks are lashed to the rim on either side. The handles stop flush with the rim at the unclosed end and project backwards for 10 inches at the other. The sticks not only form the frame of the scoop at the rim but the projecting ends form a handle. The handle sticks when crossed over each other open out the unclosed end to form the scoop.

The technique demonstrated by an old chief of Ngataivai is important as it proves that the sennit baskets obtained at Ofu and at Safotu in Savaii are of local make as the Samoans maintained and are not a diffusion of actual material from Melanesia, as an isolated example might have lead us to infer. The baskets are no longer in demand but the whitebait run is an annual occurence which the Ngataivai people fortunately deal with by their old time method.

A piece of sennit braid was tied by one end round a carrying pole and stretched taut round an end of the pole. On the stretched line so provided loops were set up with a knot resembling the netting knot. (See figure 258.)

There are three ways in which the scoop is used:

1. In the stream. To scoop up the shoals as they are working up the stream from the sea, two people work together. One carries an *ola* fish basket as a receptacle for the catch, and the other uses the scoop. The scoop is opened out and the right hand grasps the crossed sticks with the thumb passing over the crossing to the inside of the scoop. (See Plate XLII, *A.*) The divergence of the handles is thus controlled and the scoop kept open. Both fishermen wade in the shallow stream and the scoopbearer, after ladling up the fish, empties them into the basket held open by his assistant.

2. Over rocks (*papa*). The two streams up which the fish come have a number of shallows where flat rocks (*papa*) appear just above the surface.

The fish on their way upstream wriggle over these rocks. The fisherman holds the scoop below the rock and with a *salu* broom of coconut leaflet midribs brushes the fish off the rocks into the scoop.

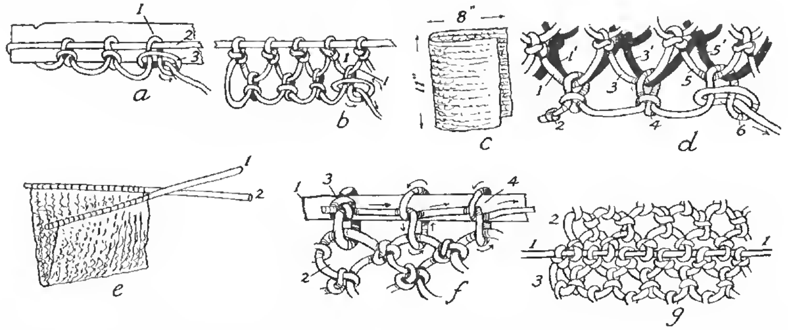


FIGURE 258.—Technique of whitebait scoop (*fonoti*) : *a*, the braid (1) was earried over the line (2), brought down behind it and held below the line by the left hand. The braid makes a wide loop (3) to the right, passes over both limbs of the loop around the line, passes baek below them from the left and eomes up through the loop (3) on the right. The knot is drawn taut as in the loops already made on the left. The technique of setting up loops is continued until the proposed length of the seoop is reached. *b*, The work is turned and meshes are now made by passing the braid through a loop above and tying the same knot. The knot is shown on the right where the braid has passed through the loop (1). The knot is the usual Samoan netting knot but instead of being made over the limbs of the loop above as in nets, it is made below the loop as shown. Eaeh row is made with the same number of meshes and the work turned at the end of each row so that it proceeds from left to right. With an ordinary seoop 11 inches long and 8 inches deep, eaeh row corresponds in length to the first one, namely 11 inches. The rows are added until the material is twiee the required depth, namely 16 inches. The 16-inch length is doubled to make a depth of 8 inches and one end is closed. *c*, The end to be closed is turned downwards with the folded margin which is to form the bottom turned to the left. The closing knot is the same as on the body but the braid passes over a mesh from each edge instead of one. *d*, The meshes (1 and 1') are the meshes on either side of the left fold in (*c*). A pieee of braid with a stopper knot (2) at the end is passed through both meshes and the usual knot tied below them. The braid then passes through the next two meshes on the right (3 and 3') whieh are brought together, and the knot (4) made under them. The next two meshes (5 and 5') are brought together, the braid passed through them and the knot (6) is shown in the making. The knots thus close the end up to the right edge which is to form the opening. *e*, The material is turned so that the right edge in the last figure is now above and the elosed end to the right. The two sticks are now fastened in the position shown. *f*, The end of a piece of braid is looped around the handle end (1), through a mesh (2), and tied around its standing part with the knot (3). The braid passes to the right for about 0.5 inches, turns downward through a mesh and after passing around the handle passes over and then under the standing part of the braid in the knot (4). This is eontinued till one handle is fixed, then the other handle is fastened to its upper edge in the same way. The above is the technique described by the Samoan expert. *g*, In the scoop figured, however, the loops were set up on a piece of braid for twice the depth, namely 16 inches. The material was then netted to a depth of 8.5 inehes, turned upside down, and another set of loops formed on the same braid cord (1) but on the other side from the first part (2). The loops are continued for the full length of 16 inches and additional rows (3) added for a depth of 2.5 inches. The longest diameter of 16 inches was then doubled and dealt with by elosing one end and attaching the handles.

3. Under waterfalls (*mu pangoa*). At Puleia, close to Ngataivai, there is a fair sized waterfall. The fish find their way into the rocky clefts below the overshoot of the fall. A torch made of the dry flower sheaths of the coconut (*taume*) is used to drive the fish out of the clefts when they are swept into the scoop with the *salu* broom. The torch is protected from the water spray by the large leaves of the *launga papa* placed above it. It is the heat of the torch that drives the fish out of the narrow clefts.

The season commences in August and may reach to December. The two streams frequented are Ngataivai and Puleia.

The small fish ascend the streams after coming in from the sea. The Samoans follow them upstream and the inland villages get their share. They are said to become a little smaller just after coming in from the sea but to grow larger as they ascend. The larger more mature form is called *'anamangi*. The larger fish are not sought after for themselves but are often caught whilst fishing for fresh-water crayfish. My informants had never noticed the *'anamangi* in roe or moving downstream at any particular time. Large fish follow the *ingana* in, and during the season are caught close to the shore. A small sea eel (*mango*) is caught in the sand below the fall at Puleia. If the sand is scooped up and thrown ashore, several of them are thrown out in it. They bury themselves in the sand tail first. The tail is round and pointed. These small animals also prey on the *ingana*. When they come in, the *mango* erect themselves on their tails to catch the *ingana*. The Samoans call the *mango*, the *'ata* of the *ingana*, *'ata* evidently meaning the natural enemy, as the shark is of the *atule*.

LEGENDARY ORIGIN

The *ingana* was brought from Fiji by Sina with its *'ata*, an eel like fish called the *mango*, and its guardian, a very large fish called *pa'i tele*. Sina came to visit her mother, Le Afine-vave, who lived at Afoasau between Sili and Vaiala. She was accompanied by Ili and Tangoai, both men. They caught a shark on the voyage and landed at Sapapalii in Savaii. Sina sent the men overland with the shark to her mother while she travelled along the shore with her fish.

On the journey, the two men ate the liver of the shark. On their arrival at Afoasau, they presented the shark to Sina's mother but she, seeing that the liver had been removed, reprimanded them for eating it (*fa'asua i le ate*). From this incident she named her son Fa'asua-i-au, which is the origin of a title in Afoasau.

Sina left her fish, the *ingana*, for her brother Faasua-i-au and appointed Ili and Tangoai as guardians of the fish for Faasua-i-au.

FISH NARCOTIZING

The kernel of the fruit of the *futu* (*Barringtonia sp.*) is grated on *lapa* coral (*Fungia*) and used for poisoning pools. It is usually mixed up with wet sand to form balls called *maunu* (bait). Perforated tin has taken the place of coral as a grater.

The *'avasa* (*Tephrosia piscatoria*) is also said to have been used. Stem, roots, and leaves were all pounded together between stones and made into balls like the *futu*.

The poisoning of smaller pools is termed *oloolo*. The method was used in conjunction with nets which were drawn round the rocks or across channels which led away from the pools. Men dived down and placed the poison below the rocks. As it permeated the water, the fish were driven out of the inaccessible crevices and in seeking to escape they were enmeshed in the nets or speared. The poison was used to drive them out rather than kill them. If too strong the fish died in the crevices and many were lost.

Poisoning on a larger scale sometimes took place with the *lauloa*, where again the object of the poisoning was to drive the fish out of their refuges. In this form the families contributed their share of grated poison.

A man was seen using poison to obtain bait for the modern hook. He spread a *lavalava* over a small pool and then pushed the poison in under the cloth. The small fish soon began wriggling out of the pool and as the man saw a fish wriggling under the cloth on the margin of the pool he seized it through the cloth.

WALLED FISH WEIRS

The principle of the weir is seen in the v-shaped lines of coconut and banana leaves, and the winged nets with a purse in the middle. Walled weirs of stone were known throughout the group but confined to practically one village in each of the three large islands and the Manuan group.

The walls, made of loosely built coral stone, were termed *pa* and the fish weir, *pa i'a*. With the exception of scanty notes from Savaii, the data and diagrams here recorded were obtained from the answers sent in to Mr. Stokes (35) in reply to a questionnaire on walled fish traps sent out from Bishop Museum.

In Savaii weirs of loosely built coral were made in the bay at Iva. The rough sketch (fig. 259, *a*) was drawn for me by Sua of Iva. The walls were renovated each year before the season. They are not used now and have fallen down.

Regarding Upolu weirs, Dr. E. Schultz, Chief Justice of German Samoa in 1911, wrote in a letter to Mr. Stokes:

> Walled fish traps are also unknown in German Samoa (Upolu and Savaii), except the village of Falelatai in South Aana (Upolu) where the lagoon is shallow enough to allow the building of such walls. These Falelatai walls are also called "*pa*." These Falelatai *pas* are built only temporarily and after use are pulled down again in order not to stop the traffic of boats in the lagoon. Size varying. Height about 5 feet. Each family or each *fuaiala* (division of the village) have their customary place where they build their *pa*. Some find it more convenient to make the *pa* of *laufala* (pandanus leaves) as the piling up of stones and their pulling down again means work. The following kinds of fish are caught in the Falelatai *pas*.

1. *Vete* (chiefly—*Mulloides vanicolensis* Bleek).
2. *Mata'ele'ele*—very likely the first stage of the *filoa* (*Lethrinus reticulatus*).
3. *Malauli*—*Caranx hippos.*
4. *Lo*—*Trentis.*
5. *Malava*—*Trentis.*
6. *'Umiumi*—*Polynemus phlebejus.*

The fish were caught by means of a hand net by the men who are waiting at the entrance of the *pa* when the tide is going out.

There are as far as I could ascertain no traditions in Falelatai concerning these traps (my authority being a *tulafale* orator of the very best reputation in such things) and, as stated above, in no other village in German Samoa are such traps known.

Schultz also made the sketch of the weir shown in figure 259 *b*. He evidently had not heard of the Ivan traps in Savaii.

In Tutuila the weirs were situated at the mouth of a bay or lagoon between Nuuli and Tofuna. From the notes supplied by N. E. Crosse, Governor of American Samoa in 1911, and Mr. J. L. Lisonbee, the following is recorded.

Figure 259, *c*, from Mr. Lisonbee's sketch shows that the walls were so built as to form weirs with the entrances opening both towards the sea and towards the shore. Fish coming in on the rising tide were caught in the

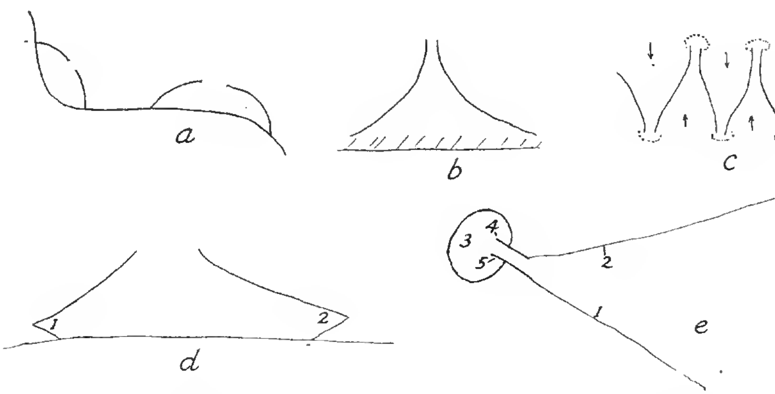


FIGURE 259.—Outlines of walled fish traps and modern trap (*e*): *a*, Savaii trap at Iva sketched by Sua. Curved walls stretched out from the shore, the opening closed with a leaf sweep after the fish had entered. *b*, Upolu weir at Falelatai sketched by Dr. Schultz. The curved walls were from 200 to 300 feet in length, and the narrow opening 2 to 3 feet wide. A scoop net was used at the narrow opening. *c*, Tutuilan trap at Nuuli, sketched by Mr. Lisonbee; length of walls 420 feet, width across wider openings 400 feet; arranging to form alternate narrow openings towards sea and shore; fish caught at exits with nets. *d*, Manuan trap at Tau, sketched by Mr. A. G. Meyer. The distance on the beach between where the walls touch is about 250 feet but each wall ran out to a sharp angle a little distance from the shore. The distance between the outside ends is 100 feet. Used in conjunction with leaf sweep to drive fish into sharp angles (1, 2). *e*, Modern trap at Fangamalo, Savaii, made of wire netting attached to stakes. Two long lines (1, 2) intercepted the fish, which were led into the circular enclosure (3) from which the projecting arms (4, 5) prevented the fish finding their way out.

first set and fish returning to the sea on the falling tide were intercepted by the others. The traps spread right across the lagoon entrance, there being 7 narrowed exits towards the shore and 6 towards the reef. The distance covered from shore to shore was about 208 rods. The walls were of coral rock from 2 to 4 feet wide at the bottom and about 3 feet high when examined. When in use, they were probably higher. The fish were caught at the exits with nets. The traps belonged to the people and had been in existence "before the time of the grandparents of the oldest inhabitants." These were the only traps known in Tutuila.

The traps were visited by Mr. A. G. Mayer (35) in 1920, but only the remains were seen. The walls were knocked down by a storm and the weirs have gone out of use.

In Manua stone weirs were used at Tau on the island of Tau. The sketch in figure 259, *d,* was made by Mr. Mayer. There are really two blind v-shaped walls with the long outer walls towards the reef and with a gap of about 100 feet between their ends. Through this opening the fish passed and when the shoals were in, a coconut leaf *lauloa* was drawn across the opening. It was then swung round in whichever direction the shoals went until the *lauloa* extended from the end of the particular long arm of the weir to the shore. The *lauloa* was then swept along towards the closed point of the "V" and the fish were secured by hand nets and spearing. In 1920, the pointed ends were in good preservation but I saw nothing of them seven years later. Kramer (18, vol. 2, p. 188) pictured the same weir years previously when it was being used to catch *atule.*

Both the Falelatai and Nuuuli weirs provide converging walls which force the fish through an opening into the net. The methods at Iva and Tau are simply an open enclosure which must be closed with the coconut leaf *lauloa.*

In Upolu and Savaii there are now many v-shaped weirs with walls made of wire netting supported by stakes driven into holes made with an iron crowbar. The shape of one seen in Savaii is shown in figure 259 *e.* The long arms were set so that they stood obliquely across the line of the falling tide. There were two widths of wire netting at the deeper part. A circle of wire netting was made round the apex and the two walls prolonged into it. This prevented the fish from getting out as they worked round the netting and could not find the opening. The form may be old but the method of execution is modern. At Fangamalo, large numbers of *atule* were caught. The advantage of a wire netting trap is that it is permanently set and does not need watching.

FISH TRAPS

From information obtained in both groups, samples of all the known types of Samoan fish traps were secured. Though the manufacture of certain

types is being forgotten in some districts, it survives in others. Those who had forgotten the technique were able to say where it was still in use. Samoan traps made with vines and light wooden rods may be divided into six types. Of these, one is manipulated by the fisherman, and five are self acting.

The material for the lobster pot type, which is the most widely distributed, is the vines or aerial roots of the *'ie'ie* (*Freycinetia*). The roots are collected in lengths, the older roots are discarded as they are brittle and liable to break when bent. The vines are bound in a coil about the size of a motor tire for carrying home. The coil is soaked in sea water and then beaten against the rocks on the shore to denude the vines of the outer bark (*pa'u*). When cleaned the material is termed *sala* in Savaii. In Tutuila certain traps were made of *'ie'ie* which in Savaii were said to be made of *sala*. It was some time before I found out that they were both *Freycinetia*. On pointing this out, the Savaiians maintained that the traps were not made of *'ie'ie* but of *sala*. "Don't the Tutuila people clean the *'ie'ie?*" they asked.

"Certainly," I replied.

"Then," they remarked triumphantly, "They make them of *sala* and not of *'ie'ie*."

If the traps are not made soon after the *sala* is prepared, the material is left out at night exposed to the dew to soften it. Three types of trap are made with this material.

A fairly thick, creeping vine (*tuafanga*) is used to make the large double entranee traps (*fangauli*). If not used immediately after the vine is brought in, it is kept soaked in water to keep it from drying. In Tutuila, *tuafanga* was applied to the aerial roots of the *'ie'ie*.

Bamboo is used to make *fanga'ofe*. The *lafo* creeping plant with long thin stems, and also fine wooden rods are used to make the sea eel trap.

MANIPULATED TRAP

This trap with the longest name (*fanga fa'atau tu'u'u*) is also the smallest. The type specimen in Bishop Museum (Pl. XLII, *B*) is made of single warps of dressed *'ie'ie* (*sala*) with a single pair twined weft of the same material. The trap is commeneed at the bottom. (See figure 260.)

The trap is used by women, in day fishing amongst the coral in the shallow parts of the lagoon, to catch the dark fish (*tu'u'u*). The woman with an *ola malu* basket tied around her waist wades out to where branching coral (*'amu*) is plentiful. To commence with, she plaees a dark stone about the size of the fish in the trap and lays it on its side near the spot where she sees the fish. The *tu'u'u* is very aggressive and can be seen darting about ready to fight anything of its size that offers. Leaving the trap on the bottom, the woman remains within reach, with her head submerged, watching the trap. The

tu'u'u seeing the black stone which acts as a lure, without hesitation enters the trap to offer fight. The woman immediately places her hand over the entrance and lifts the trap. The first fish caught replaces the stone as a decoy. A short piece of coconut leaflet midrib with a piece of coconut husk fibre tied to its middle is pushed through the lower lip from below and the midrib crossed inside the mouth. The fibre is then tied to the inner end of the trap with the live decoy inside. The trap is again set, closed with the hand as the fish enters and the catch lifted. The *tu'u'u* seem to have no hesitation in entering, taking no notice of the proximity of the fisherwomen. The trap with the decoy causes the fish to want to fight (*fa'atau*) ; hence, the name of the trap in full is *fanga fa'atau tu'u'u* (the trap which causes the *tu'u'u* to fight). The women move about among the groves of coral seeking the frequented spots and they catch fairly large numbers. The introduction of water goggles has assisted the method very much for any movement of the fish can be clearly seen. It is almost ridiculous the quickness with which the fish enter the trap and the equal celerity with which the female hand descends over the opening. No such traps were seen in use in Tutuila but they were known. In Savaii it is the commonest form of fishing used by the womenfolk and their easiest way of replenishing the larder with flesh food.

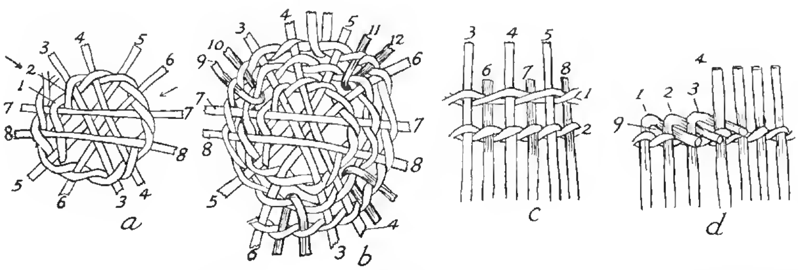


FIGURE 260.—Fish trap (*fanga fa'atau tu'u'u*), single-pair twine: *a*, three pairs of warps (3 and 4, 5 and 6, 7 and 8) are crossed in their respective pairs to radiate as evenly as possible, two weft elements (1, 2) are twisted around the warp (7), the weft (1) passing above and the other (2) below it. It is usual to tie the two weft ends together with a piece of sennit fibre to keep them from coming apart until the twine is established. The weft (2) which passed under the warp (7) is twisted upwards with a half turn to pass above the next warp (3) while the other (1) passes under it. The twine is carried on around the other warp in half turns, one weft crossing above a warp from below upwards and the other weft crossing under the same warp from above downwards. Each half turn makes the weft elements change position on the next warp. The twine is carried around in a circle which is kept an even distance from the centre until the twine approaches the commencement when it is diverged outwards to cross the first warp (7) a little distance out so as to carry on the twine in evenly spaced spiral turns. The inclusion of the warp (7) concludes the first round of the twine; it is obvious that as the twine proceeds there will be wide gaps between the adjacent pairs of warps and fresh warps will have to be added to fill the gaps. *b,* A second round is completed on warp (7) and before passing on to warp (3), the gap is filled with two new warps. A strip of material is pushed down over the completed second round of twining and under the centre of the work until its middle rests on the twine, the outer part (9) is included in

a half turn of the twine as a new warp. The other end (10) is doubled back under the twining of the second round, spaced as a warp, and included in the next half turn of the weft twine. The twine now reaches the next original warp (3) and passes around the warps (3 and 4) in the usual way. Theoretically fresh warps should be added in the space between 4 and 5 but it is left to the next round. After including the warp (5) in the twine, the craftsman found that the pair (5 and 6) had become diverged too much so he inserted a fresh pair of warps (11, 12) in the same way as the first pair (9, 10). The gaps between the warps (8 and 4) and between 3 and 6 are also filled in with fresh pairs. The first and second rounds of twining were carried on with six warps but in the third round, already eight new warps have been added. *c*, The twining is carried on, new warps being added in pairs as already shown or in single warps if the gap is not too wide; in the upper twine (1), the warps (3, 4, 5) have been included but in the next round (2), three new warps (6, 7, 8) have been included in the twining while their upper ends are shown behind the upper twine (1) but not included in it; the symmetrical addition of warps continues until the twining reaches its maximum with 32 warps in all; the twining is continued round the maximum number which causes the warp to be bent in longitudinally and the twining continuing to form successive rounds, half an inch apart, the trap assumes a tubular form; the sides are gradually narrowed by decreasing the spacing between the warp in each round and towards the rim; two warps here and there are included in the same half turn of the weft twine; from 6.25 inches at the maximum diameter, the trap is diminished to 4 inches at the rim; the trap is so small that the warps do not need joining. In the case of a shortening weft element, another strip of material is simply added to the shortening element and the two treated as one weft element until the old element comes to an end and the new one carries on. The end of the new element is inserted between the other two so that it is locked in position. *d*, The last round is ended close to the preceding one to define the rim, which is finished off just beyond the last round, by bending each warp in turn around the back of the warp on its right and through in front of the next on the right. The warp (1) has been bent down around the back of (2) and through to the front of (3). Warp (2) does likewise by passing behind (3) and in front of (4) and by doing so locks the warp (1) in position; this is continued around the rim and when it comes to the immediate left on the warp (1), the last warp will pass to the back of (1), come forward through the space (9) and rest in front of (2).

The long ends of the warps may be cut off or they may be wound around the circumference of the rim to thicken it, when it is usually seized with sennit braid as in the trap in Plate XLII, *B*.

The *tu'u'u* is one of the fish that is eaten raw. A saying connected with this is as follows.

E uliuli fua le tu'u'u ae otangia (The *tu'u'u* is black but it is eaten raw).

The significance is that blackness is associated with dirt and low status; the fact that a fish is eaten raw shows that it has an edible status above many other fish that are not so eaten. The saying is meant to drive home the fact that appearances are deceptive.

SELF ACTING TRAPS

The self acting traps are built on the principle of the lobster pot. They have a more or less funnel-shaped entrance with the inner, smaller end suspended in space. Being away from the walls, the fish have very little chance of finding it as a means of exit. Some traps are baited and others unbaited. Some are rounded exactly like the lobster pot and have the entrance on top.

Others are cylindrical with the hole at one end, and others again are barrel-shaped with a hole at either end. Another form is shaped like a flat box. The technique ranges through twining, wrapped work, and basketry. On the whole there is a fair range of method though the self-acting principle is the same.

THE LOBSTER POT TRAP

The lobster pot type consists of rounded traps made of *'ie'ie* aerial roots by single pair twining. The traps are set with the entrance on top. There are three variations of the trap; the fish pot, the crab pot, and the crayfish pot.

The fish pot (*fanga i'a* or *fanga puapua'i*). In eastern Samoa, the trap (Pl. XLII, *C*) used to catch vertebrate fish is termed *fanga i'a* (*i'a,* fish). In western Samoa it is always alluded to as *fanga puapua'i.* The term *puapua'i* means the smell of the newly disturbed coral sand and rocks such as is produced when the sea bottom is scooped out or cleared of small rocks to form a bed for the trap. The smell of the *puapua'i* attracts fish to the trap and causes them to enter in search of the food they expect to find in disturbed ground. The *puapua'i* itself is the bait and no material bait is used.

The prepared *'ie'ie* (*sala*) is used. The straight warp elements (*fa'atu*) are single while the twining weft pair (*ta'ainga*) contains two single elements. As the entrance projects into the trap it has to be made first and the bottom last, which is the opposite to the *tu'u'u* trap described in figure 261.

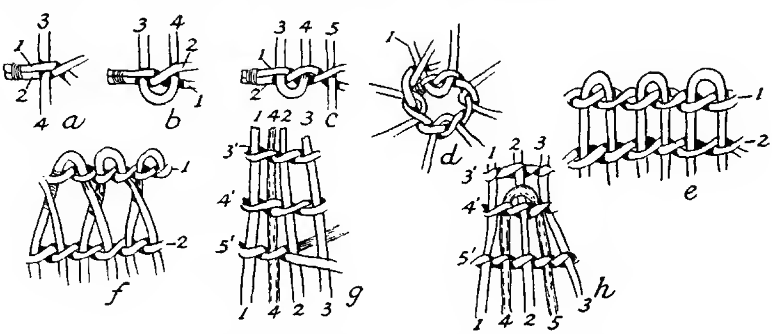


FIGURE 261.—Fish trap (*fanga i'a*) single-pair twine: *a,* The two single weft elements (1, 2) are tied together at one end with coconut fibre. A long strip of root (3) is placed between the weft elements at its middle and a half turn made around it. The end (3) of the long root forms the first warp. *b,* The lower end (4) of the long strip is bent upwards and placed between the weft elements. *c,* Another half turn is made with the weft elements and the warp (4) is fixed in position. A fresh warp (5) is placed in position between the weft elements and dealt with in half turns of the weft as with the first doubled warp (3, 4). The technique is continued until 8 doubled pieces have added 16 warps to the twined weft. *d,* The twined row is bent around into a circle but in the figure, the doubled back warps are shown diverged outwards to emphasize the technique of the twined row. The wefts are twined around the first warp (1) close to the commencement turn and the opening is fixed. In the figure only 8 warps are shown.

e, The twining continues around the 16 warps but diverges out so as to get its proper spacing from the first round (1). It simply continues in a spiral as in the case of the *tu'u'u* trap. As the same number of warps continue to be entwined a tube results. The second row (2) twining may take each warp in turn as they are in the first commencing round. Here the warps are parallel in the first outer weft space. *f*, It may, however, be easier to form a less abrupt bend where the warps are doubled back. Instead of taking each warp in turn as they are in the first round (1), they may be crossed. The two limbs of the same piece instead of being adjacent in the second round (2) are diverged so that there are two other warps, one from either side, between them. The warps are thus crossed in the first interspace. After the second round they remain parallel. The tubular funnel is continued for three to four rounds of twining. The funnel itself is called the *pu* and the outer opening is the *ngutu*. From the *ngutu*, the trap must be gradually opened out by the addition of fresh warps to form the gradual slope and surface that leads to the funnel entrance. This upper surface is called the *malae* from the idea that the fish play about there and then enter the house. (See Plate XLII, *D*.) *g*, Fresh warps are added in a different manner to that in the *tu'u'u* trap, where a piece was simply doubled round the twining of the preceding twined round and the two parts formed adjacent warps on the round being twined. In the completed rounds (4′ and 3′) three parallel warps (1, 2, and 3 are shown). On the twined row (5′) which is being made just outside the *ngutu* outer opening of the funnel, the warp (1) has been included in the twine. A fresh warp (4) is pushed down under the work so that its middle is approximately about the level of the completed round (4′). The fresh warp (4) is included in the twine of the fifth row. *h*, After including the fresh warp (4) the next warp (2) is included. The other end of the new warp (4) is pulled up beyond the last round (4′), crossed over the warp (2) and returned under the twined row (4′) to form a second fresh warp (5). This is included in the twine as well as the next warp (3) and the twined row continues normally until fresh warps have to be added. The addition of the two new warps (4 and 5) has spread out the trap and will increase the circumference of the twined row (5′). Fresh warps are added symmetrically to the twined round to keep the trap increase symmetrical. When the *malae* is of sufficient size, the warps are gradually curved to form the sides. Fresh warps are added on different rounds until the trap reaches its maximum diameter. It is then sloped towards the bottom by bringing warps closer together.

In the fish pot figured (Pl. XLII, *C*), the funnel started off with 18 warps and is 4 inches across the inner opening and 4.5 inches deep. Fresh warps were added till they reached the maximum number of 47 with a maximum trap diameter of 18 inches. The warps were decreased by bringing two together until the trap had reached a total depth of 11 inches and the last turned row left an opening 5 inches by 4 inches in cross diameter. The opening is left patent to form the *muli* of the trap. The edge of the *muli* opening is treated in two ways: *a*, the warps are cut off 3 inches from the last twined row which was closed in against the preceding round of twining. The ends of the weft elements are twisted round to the outside and stayed against the nearest warps, which prevent them from springing back. Each warp element is bent down at right angles, twisted to the right to the inner side of the warp immediately on its right and to the outer side of the next. This is done successively in the same way as the finish of the opening of the *tu'u'u* trap before it is bound. The first holds securely without further assistance. *b*, A more elaborate finish is to leave one or both of the weft elements long. After treating the warp ends by method *a*, some strips of vine are run around the circumference to cover the warp ends. The warp ends are then lashed with spaced turns around the thickened rim to hold everything in position. (See Plate XLII, *E*.)

The trap is set in likely looking pools or passages from the reef. The spot selected is cleared of stones until the coral sand is reached. The open bottom of the trap is fitted against the sand. Stones are packed and fitted

around the trap to raise them to just above the middle. Any large interstices between the stones are filled in with smaller stones to close open crevices into which the fish could go. The stones thus built up not only anchor the trap firmly but seem to attract the rock-frequenting kinds of fish for which the traps are primarily intended.

Some pieces of branching coral are built up over the outer entrance by interlocking their branches and at the same time leaving plenty of room for fish to get through to the opening. The coral house (*fale'amu*) keeps the big fish away from the trap entrance, which they might break in pursuit of smaller fish. Fish enter the trap to take refuge from larger fish as well as in search of food. The setting of the trap takes place under water and the fisherman has to dive about collecting and piling the necessary stones.

The trap is visited at low water. The fisherman dives down to see if there are any fish. If so, he clears away the coral house and the stones immediately around the trap which kept it down. The hand is inserted through the funnel opening and grasps the rim of the *muli* opening, the wrist being bent down to close it. The trap is lifted and the contents emptied into a basket through the bottom opening.

Before the trap is reset it is washed to get rid of any slime or seaweed that may adhere to it. The hand is then waved backwards and forwards over the sand at the bottom to stir it up. This also brings out the *puapua'i* smell. The trap is then put back and the stones and coral house replaced.

The crab pot (*fanga pa'a*). Crab pots seen in use at Nuuuli, Tutuila, were exactly the same in shape and make as the fish pots except that they were stronger. Strength was obtained by using double elements. Each warp consisted of two strips of *sala* treated as one element by both being enclosed in each half turn of the weft twine. The weft consisted of four strips, a pair acting as a single element in the twine. Ordinary fish pots may be used for taking crabs but in places where crabs are abundant, they are made stronger. The opening at the bottom was also present. Even the lobster pot shaped *'enu* is sometimes used. In the large shallow lagoon with a soft muddy bottom at Nuuuli, crabs are abundant and it was there that the method of setting the traps was demonstrated.

Crab pots differ from the fish pots in being baited. The best bait are the *tupa* crabs with large red claws which are dug up out of their holes in the beach. These are broken up into suitable pieces between stones. A family were seen baiting a trap by three stages. One woman was tying slip knots on strips of *fau* bast, with an overhand knot around the standing part. A boy put pieces of crab through the loop and pulled it taut. Another woman attached the bait to the trap by lowering a piece down into the trap on one

side of a twined row, letting down another on the other side and then tying the ends of the *fau* together in a reef knot over the twining in such a way that the bait hung clear of the bottom. The bait was hung from all parts of the roof of the trap.

Three traps duly baited were taken out on a *paopao* canoe to a still arm of the lagoon at high tide. We went out for about a hundred yards to where the water was waist deep. The fisherman glanced ashore and picked up a landmark. He made a depression in the soft mud with his feet and placed the bottom of the trap in the hollow. He felt about with his feet and if unsuitable increased the size of the hollow. Though the trap was open structurally at the bottom, this fitted into the depression. In addition, a flat stone inside the pot was placed over the bottom opening to serve both as cover and as anchor. Hence, the crab pot was anchored from the inside and not by heaped stones on the outside as were the fish pots.

Each trap had a float consisting of a section of dry coconut husk (*pulu*) tied to the top of the trap with a strip of *fau* bark 4 or 5 feet long. The husk was a quarter section of the whole husk and when split in this way to make floats (*uto*) is termed *fa'autouto*.

The three traps were set about 20 yards apart and in the same straight line. After setting the last trap, another shore observation for landmarks was made. The line of the traps is important not only for the purpose of picking them up readily, but also to settle any argument that may subsequently arise with another man who may set traps close at hand.

The pots were set in the evening and picked up early next morning. The traps are taken home with their contents as they have to be rebaited. At home, the stone covering the bottom opening is pushed to one side and the crab shaken through the bottom opening. It is astonishing how a large crab will slip sideways through the comparatively small hole when it feels the opening beneath it.

A trap broken in places was seen mended with wide strips of pandanus and banana leaf threaded through the neighboring parts on either side of the hole. The repairs looked flimsy but the pot caught crabs.

Crayfish pot (*fanga ula*). The crayfish is termed *ula* and the sea crayfish, *ulatai,* to distinguish it from the small fresh-water form (*ulavai*). The trap, used only for the sea crayfish, takes the name of *fanga ula.* Though *vai* means water, in which both species live, *vai* as an adjective always refers to fresh water.

The crayfish pot is of the same type and technique as the fish pot. It is, however, stronger than the crab pots seen at Nuuuli. Another feature is that there is no hole left patent at the bottom. In the type *fanga ula* shown in Plate XLIII, *A,* the individual warps vary in the number of strips used, the range being from two to six. The weft pair starts off with two of each weft

element in the turning of the funnel which increases to three on the body. Where the joins in the weft occur, the twining is, of course, thicker.

In the type pot, the funnel has very little slope, the inner opening having about the same dimensions as the outer. From the outer funnel opening, the bottom is very flat, there being little of the gradual slope seen in the fish pots. This has been purposely done, by doubling a loop forming two fresh warps around every alternate original warp and bending back every original warp abruptly at an angle instead of a curve. Thus, the warps are doubled in number at the outer opening and not gradually as in the fish pots. The weft twine ranges from 1 to 1.5 inches apart but the warps are more widely spaced, ranging from 2 to 3 inches apart. The last weft round forms an ellipse, 4 inches by 3 inches in cross diameter. The warp ends cross each other over the opening and a few longer elements are doubled around them and caught under elements to keep them together. The upper surface has the curve flattened more by narrowing the warp spaces and bringing two elements together sooner than in the fish pots.

The crayfish pot is baited with *alili* (*Turbo*) which has a hole broken on one side to expose the fish. It is set in the same way as the fish pots by heaping stones around it, but the coral house (*fale'amu*) is not made over the opening. A young crayfish is sometimes placed in the trap as a decoy for it is said to make a noise which attracts the adults.

THE SEPARATE FUNNEL TRAP

The separate funnel traps (*'enu*) resemble the preceding lobster pot type in the principle of the funnel entrance and being made of *'ie'ie* aerial root material, but differ widely in being made in two pieces. A wrapped twine stroke is used instead of single pair twining. In principle, it forms a link between the manipulated trap and the self-acting traps. The bottom and body of the trap are made and finished off at a rim opening as in the manipulated *tu'u'u* trap. The self-acting principle embodied in the funnel-shaped opening projecting inwards is then made as a separate piece. The funnel piece is fitted to the rim opening of the body and the two lashed together. The body of the trap is thus commenced at the bottom as owing to the funnel entrance being made separately, no complication will occur with it. In the lobster pot trap which combines both funnel and body in one piece, the trap commences with the funnel and ends at the bottom. Two types of trap made with the same technique, but of different shape, are both termed *'enu,* which name has also been applied to certain manipulated nets on frames and to the palolo scoop. The tendency to interchange the *n* and *ng* sounds is particularly noticeable in the modern use of the term *'engu* for these traps. The word *'engu* does not occur in Pratt's dictionary. The two forms of trap may be classified according to shape as the lobster pot and the domed cylinder forms.

The warps consist of single elements of *'ie'ie* root arranged in an outer and an inner series in relation to the passive element of the weft. The weft is compound, consisting of two or three strips of *'ie'ie* root and a single length of three-ply sennit braid. The root elements are kept close together and, except for passing spirally in spaced rounds between the two sets of warps, are entirely passive. The braid is the active element which, by passing obliquely over the crossings of the warp with the passive weft elements, binds them firmly together with a wrapped twine.

The method of commencing at the bottom with the outer and inner series of warps, the stroke technique, the body, rim finish, and the separate construction of the funnel are shared by both forms of trap. (See figure 262.)

The lobster pot type of *'enu* (Plate XLIII, *D*) commenced with two sets of five warps in each series. Immediately after reaching its maximum diameter it was narrowed down gradually to its rim diameter of 20.5 inches. The narrowing was brought about by gradually bringing the warps closer together. This technique influenced the shape and gave it the typical lobster pot appearance. The funnel technique and fitting are as described in figure 262 except that it is a little smaller.

The lobster pot *'enu* is still made in Tutuila and Manua, where it is used for catching *i'a sina,* a fairly small fish. The technique of the wrapped twine was an alternative to the frame net *'enu* used in Savaii for the same fish. The trap is set with the opening upwards and a bait is used.

The domed cylinder type of *'enu* (Plate XLIII, *E*) commenced with two sets of five and four warps in each series. The fresh warps were added quickly, 12 fresh pairs being looped over the first round. By the time the eighth round had been reached, 72 additional pairs in all had been added. The trap was then 6 inches deep with a diameter of 17 inches. After forming the dome end, very few fresh warps were added, which resulted in the trap continuing in a cylindrical form. Between the 8th and the 27th (last) rounds only four new pairs of warps were added, which increased the diameter from 17 inches to 19 inches at the rim. Of the total length of 28 inches, 6 inches were occupied by the dome-shaped part and 22 inches by the cylindrical part. The funnel and attachment were described in figure 262.

The domed cylinder trap is used at Vaimoso and Vaiusu in Upolu in connection with the plaited coconut leaf sheets used in the *puni* method of fishing described on page 434. The traps are set opposite the openings made for them. They are laid on the sides and attached to stakes. Fish returning to sea on the falling tide, pass through the openings into the trap. The method resembles somewhat the use of the net *'enu* with leaf weirs in Savaii but the *'enu* of *'ie'ie* roots is self-acting.

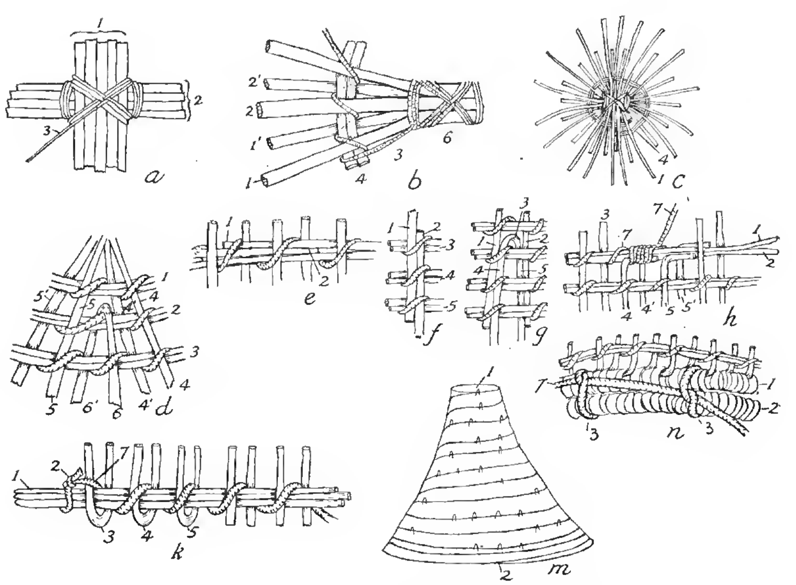


FIGURE 262.—Technique of *'enu* fish trap: *a*, five long pieces (1) of *'ie'ie* root are crossed in their middle at right angles to four others (2) to form the foundation warps of the outer set of 18. A second series of 5 and 4 is crossed similarly below them to form the inner set of 18 warps. The crossings of both sets treated as one are lashed together by transverse and diagonal turns of sennit braid (3). The braid is fixed with a half hitch or overhand knot and left long to continue as the active element of the weft. In the figure, the outer layer only is shown. *b*, The two passive weft elements (4) are passed between the outer and inner warps on the left. The nearest of the transverse warps (1) is bent downwards to bisect the angle between the transverse and longitudinal sets of the outer layer. For convenience the root elements of the weft will be referred to as the weft and the active element simply as the braid. The braid (3) is carried from the central lashing (6) along the first warp (1) to take a turn over the weft (4). Appearing on its right side, it crosses over the front of the outer warp (1) from right to left and runs obliquely from left to right over the back of the first warp (1′) of the inner series. Appearing on the right of the weft (4) it repeats the oblique turn over the next upper warp (2) and at the back over the next inner warp (2′). *c*, The wrapped twine is continued, taking the next warp alternately from the two series and bending them as shown to spread the whole outer series of 18 warps evenly while the inner series appear in the spaces. The weft (4) was originally spaced on warp (1) at about 1 inch from the central lashing and this distance is maintained with each warp until the starting warp (1) is neared, when the weft diverges outward in order to continue the rounds as a spiral. The spiral is continued after crossing the warp (1) with 0.5 inch space between the weft rounds. *d*, Fresh warps are added as the foundation warps diverge, by doubling a long piece of root round the preceding weft round to form two warps, one going to each series. The space between the inner warp (4′) and the outer warp (5) has diverged on the second weft round (2). When the next round (3) reaches the inner warp (4′), a long piece is doubled over the preceding weft round (2) between the warps (4′, 5) and one part (6) is brought down on the outer side of the third weft around (3) to be wrapped as an outer warp while the other part (6′) comes down under the weft round to be

wrapped as an inner wrap. The wrapped twine goes on the next outer warp (5) and the addition of 2 new warps is completed. Fresh warps were added in the lobster pot *'enu* as follows: third round, 6; fourth, 8; fifth, 8; sixth, 10; seventh, 12; and so by regular spacing the symmetry of the work was maintained. The space between the weft rounds continued at less than 0.5 inch. The lobster pot (*'enu*) reached its maximum diameter of 25 inches at about half its depth of 18 inches and then there were 184 warps counting both series. The warp interspace in the outer series was 0.75 inch. On reaching the maximum diameter, the technique varies. The lobster pot begins to decrease the diameter by lessening the inter-warp space until it reaches the rim diameter of 20.5 inches. The dome cylinder type continues with the maximum diameter by keeping the same interwarp space and the same number of warps. *e*, The passive elements of the weft are reinforced by simply adding another element (2) to the shortening one (1) with an overlap and including the 3 elements in the twine until the short weft (1) drops out. *f*, A shortening warp (1) has a fresh warp (2) added to it, two or more rounds above its end and the two elements (1, 2) are included in the twine or successive weft rounds (3, 4, 5) until the short weft (1) drops out and the fresh weft (2) carries on. *g*, When an outer (1) and an inner (2) warp both fall short, a fresh strip (3) is doubled over a weft round before the ends are reached and one limb (4) reinforces the outer warp (1) while the other limb (5) reinforces the inner warp (2). *h*, The rim. When the depth or length of the trap is reached, the rim is formed by cutting the long warps, bending the short ends down at right angles to the right on the weft and lashing them to the weft by close transverse turns of the braid. Thus, after the braid (7) passes the inner standing warp (3), the outer warp (4) and the inner warp (4′) are bent down on the weft and lashed by the close transverse turns of the braid. When the braid reaches the next warps (5, 5′) they are bent down and so the braid will lash the warps successively to the last round of the weft to form a smooth wrapped rim. As the close turns of wrapping approaches its commencement, the weft is made to gradually approach the preceding round and coincide with it at the commencement when the last standing warp (3) is bent down. The weft elements are cut off and the seizing overlaps its commencement to conceal both the bent down warp (3) and the end of the weft. The braid is tied with an overhand knot and cut off. *k*, The funnel technique is the same for both traps and commences at the inner opening. The funnel described is that of the dome cylinder trap in which the passive weft elements consisted of 3 pieces of root. The 3 elements (1) are tied together with the braid (7) at the slip knot (2). The warp elements are added as shown by the simple wrapped twine, the first 3 pairs (3, 4, 5) being doubled and the others single until 30 pairs are attached to the weft in alternate outer and inner series. *m*, The weft is bent round and tied so that the 30 pairs of warp are spaced around the first weft round and their short ends form the rim of the inner opening, which is 4 inches in diameter. From the point tied (1) the weft gradually diverges in its spiral around until the space between rounds is 1.1 inches, which is maintained throughout. Fresh warps are added in the same manner as in the body of the trap. Commencing with the second round, the pairs added to the successive rounds are as follows: 1, 3, 8, 7, 9, 4, 4, 10, 8, 10, 0. The weft rounds were 12 in all. By the end of the last round, 64 pairs had been added to the original 30 pairs making 188 warps at the rim. The rim was formed in the same way as the body rim and the last round coalesced with the preceding (2). The funnel was 14 inches deep with an outer rim diameter of 19 inches. *n*, Joining funnel to trap. In finishing the funnel, the diameter of the rim is made the same as that of the trap to which it belongs. The rim of the trap is turned upwards and the funnel fitted so that its rim rests on the rim of the trap. The binding braid of the funnel left long takes a few transverse turns around both rims and is then fixed with an overhand knot. The braid (7) is carried round the circumference in a chain knot with overhand knots (3) about 5 or 8 inches apart around the trap rim (1) and the funnel rim (2). In the figure the funnel rim is below.

DOUBLE ENTRANCE TRAP

The *fangauli* type of double entrance trap (Pl. XLIV) is a large barrel-shaped trap made of thick *tuafanga* vine. The front end (*mata,* face) and the rear end (*muli,* back) have each a funnel whose inner ends are prolonged to form an inner tube passage (*tapua*) which is blocked in the middle by a partition. On the floor of the tube on either side of the partition is an opening (*ala i'a,* fishes' path). Fish entering the funnels, pass along the passage and on being blocked by the partition, pass down through the opening into the trap proper.

The technique consists of a single-pair twine around longitudinal warps. Both warps and wefts consist of the same material; the warps are selected from the thicker pieces about 0.4 or 0.5 inches in diameter, while the weft elements are slightly thinner. The warps (*'aso*) consist of single elements and the weft (*filosi*) of two. Construction commences with the *tapua* tube. (See figure 263.)

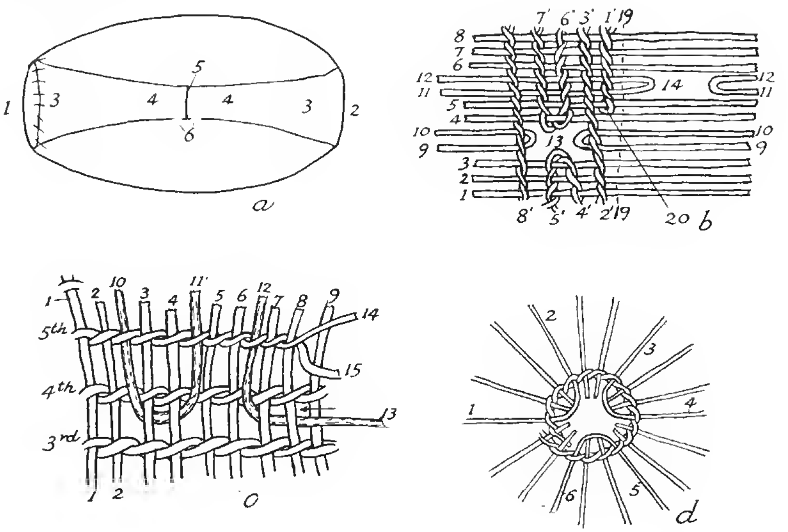


FIGURE 263.—Fish trap (*fanga uli*) technique: *a,* longitudinal section, the *mata* (1) opening 12 inches in diameter, the *muli* opening (2), elliptical through pressure, 10 by 13 inches in cross diameter. The funnels (3) lead into the *tapua* tube (4), 6 inches in diameter; partition of sticks (5); openings (6) in tube for entrance of fish. *b,* The *tapua* tube shown flattened out by cutting through the weft rounds in the middle longitudinal line above. The warps (1-8) are long warps. The pair (9, 10) is formed by doubling two long elements to leave a space (13) between their doubled ends on the *mata* side of the partition (19). The pair (11, 12) are formed in a similar way to provide for an opening (14) on the *muli* side. A long vine (20) is doubled around a bottom warp (5) on the *mata* side and commences the single-pair twined weft round which works outwards and upwards to reach the warp (8) at the point (1'). The warp (8) is really above the tube and adjacent to the warp (1) over which the weft round continues uninterruptedly at

the point (2′). The weft crosses the warps (9, 10) close to their bend and crosses the warp (5) about 1.5 inches from its commencement in order to continue the rounds in spiral turns. The weft reaches the warp (8) at the point (3′) and carries on the next warp (1) at the point (4′). The weft reaches the warp (3) and turns back as shown to form a side of the opening (13). On arriving back on warp (1) at the point (5′), it continues on warp (8) at the point (6′) whence it works in to the other side of the opening (13) on the warp (4). The weft turns back on warp (4), works out to warp (8) at the point (7′), and continues on warp (1) at the point (8′). The weft now has an uninterrupted run, passing as it does over the doubled warp (9, 10) and completing the margins of the opening (13). From now on the even spirals are continued outwards with an interweft space of 1.5 inches. Four rounds from the margin of the opening completes the *mata* end of the tapua tube. *c*, The tube is expanded into the *mata* funnel termed *sifa* by adding looped strips, with each limb between two warps from the tube. The section figures 9 of the tube warps (*'aso tapua*) crossed by the third and fourth weft rounds. The fifth round is commenced with the warps (1 and 2). The weft includes one limb (10) of an introduced pair (10, 11), crosses over two warps (3 and 4) and then includes the other limb (11) of the new pair. Two more tube warps (5 and 6) are crossed, when a new warp (12) has to be added. The new warp is added by taking one end of a long strip, passing it under the warp (7, 8) on the right and drawing it up over the fourth round until its middle is reached. The limb (12) is then included in the twine, after which two more tube warps (7, 8) are included. The other limb (13) is drawn taut to adjust the bend under the warps (7, 8) and it is brought back over the fourth weft round and included in the twine of the fifth round in the same way as warp (11). The two weft elements (14, 15) continue the twining until three fresh sets of 2 warps have been equally spaced amongst the 12 warps that came from the tube. *d*, View from outside the funnel, showing the addition of the 6 new wefts (1-6) evenly spaced with 2 tube warps between each new element. The spiral weft is continued and the funnel expands in size with each round not only owing to the increased number of warps but also to the gradual widening of the interwarp space from 1 inch to 2 inches at the end of the 7th round of the weft in the funnel. The weft has worked along the warp for a distance of 12 inches, the funnel is 11 inches in diameter and the weft ends are fixed temporarily while the other end of the tube is dealt with.

The funnel (*sifa*) of the *mata* end has been formed from 12 original tube warps (*'aso tapua*) to which three new pairs (*'aso fa'angaulua*) were added. All these warps project beyond the last weft round of the funnel and enter later into the finish of the trap.

The partition of the tube is formed of three short pieces of vine spaced horizontally across the tube. A strip of vine is doubled around one of the tube warps and two weft lines are made across the partition rods. A round is then worked around all the tube warps on the *muli* side of the partition. The opening in the floor of the tube on the *muli* side is defined and the tube and funnel of the *muli* side made in exactly the same way as on the *mata* side (figure 263).

The last twined round of the *muli* funnel forms the technical bottom (*muli*) of the trap by including the bent back warps which form the *afe* turn, and the last round of the funnel is also the first round of the body of the trap. (See figure 264.)

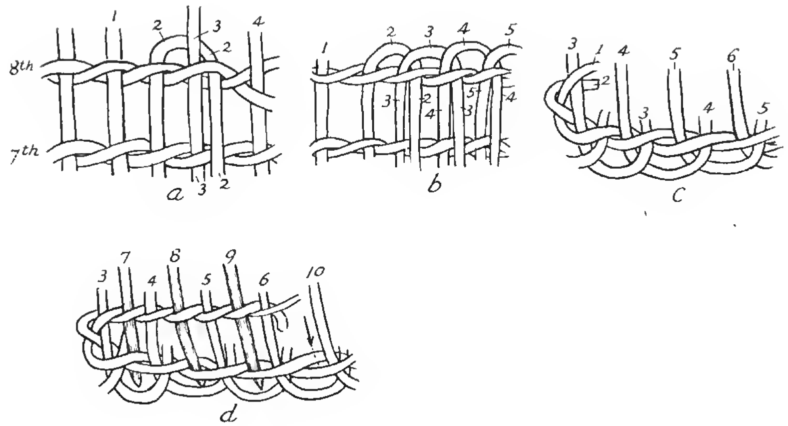


FIGURE 264.—Fish trap (*fanga uli*) turning the bottom end: *a,* The 7th and 8th twined rounds on the *muli* funnel are shown. With the 8th round commence the *afe* turns. The warp (1) is shown projecting in its normal course. The ends of the funnel warps at this end are 3 feet and more in length. The weft twine is carried round the warp (2). The warp (2) is then bent around the back of the warp on the right (3) and doubled downwards on its right side. The next half turn of the weft twine passes around both the right warp (3) and the bent-down warp (2). The twine is carried on to the next warp on the right but the left warp (3) must be bent around it before the turn of the twine is completed. Note that the turned-down warp (2) is to the outside of the funnel twine of the 7th round. *b,* The method is continued as shown where each warp in turn passed behind the warp on the right as (3) behind (4) and (4) behind (5) until all the warps have been turned back and the weft line meets the commencement. The weft line interspace was not spaced evenly as the line had to meet to define the bottom margin exactly. The weft has, therefore, to be turned down on the last warp to renew the interweft spacing. For convenience in twining the round the craftsman turned the end away from him as in the figure. It is awkward to continue working in this position as the long ends are now towards him. He therefore reverses the bottom towards him. *c,* In reversing the position of the work, however, the weft line runs from right to left which is awkward for continued work. As the weft elements (1 and 2) complete the twining around on the warp (3) they are twisted out on the left side of the warp (3) and make another turn on it from left to right to reverse the direction and work across the warps (4, 5, and 6) and those to the right in the normal left to right direction. Before, however, the weft crosses from (3) to the next original warp (4), fresh warps have to be added to expand the body of the trap. *d,* The original warps (*'aso tapua*) of the funnel that reached the turn and were bent over at the *afe* to take part in the body number 18. New warps (*'aso fa'aopoopo*) are introduced singly in each space between two original warps. The new warps measure 4 feet and are sharpened at one end. Carrying on from the last figure, a new warp (7) is introduced between (3) and (4) by its pointed end being thrust down under the weft twine of the turning round. It is then caught in the twine. The other new warps (8 and 9) are similarly introduced in the spaces between *'aso tapua.* The pointed ends where possible are thrust in between the two elements of the weft row below. Thus, the twine has ceased on warp (6). A new warp will be thrust into the twine as indicated by the arrow and then caught in the weft twine before the weft passes on to the next *'aso tapua* (10). The method of securing the weft spacing and the change in direction is thus clearly indicated.

The first weft round finishes close to the commencement and adds 18 new warps, making 36 body warps in all.

The bottom having been turned, the spiral rounds are continued around the 36 warps that now from their direction form body warps. The interweft space remains constant at about an inch but the warps are gradually diverged from an inch apart near the turn to 2 inches at the middle of the trap. From the middle the warps are gradually converged until the diameter approaches that of the *mata* funnel at the other end. Some of the warps converge to form a pair enclosed by the same half turn of the twined weft.

The warps that run short are lengthened by overlapping a fresh piece for a few inches and including the two in the same half turn of one or two rounds of the weft. The simple join (*so'o o le 'aso*) is similar to those of the previous traps. The weft join (*so'o o le filosi*), due no doubt to the greater strain in a heavy trap, is more complicated than those previously used. (See figure 265, *a, b.*) While the body is being made, an opening for the removal of fish is left on the upper surface about 18 inches from the middle. (See figure 265, *c.*)

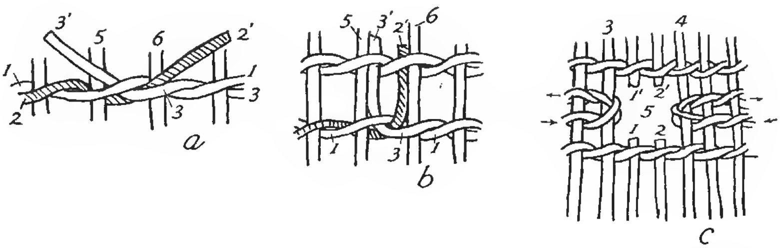


FIGURE 265.—*Fanga uli* trap: *a* and *b*, joining new weft element; *c*, exit opening: *a*, Of the weft pair (1, 2), the element (2) is short. About 4 or more inches from its end (2') a new weft (3) is added. After the twine is made around the warp (5) the new weft is placed between the weft elements with 4 or 5 inches of its end (3') projecting. Both the elements (2 and 3) pass in front of the warp (6) with the new weft (3) on the outside. The end (2') of the old weft is discarded and the twine continued with 1 and 3. *b*, When the spiral round of the weft reaches the warp (5) again, the end (3') of the new weft element is turned up on the right or joint side of the warp and included with warp (5) in the half turn of the twine. The end (2') of the old weft is also turned up on the joint side of the next warp (6) and included with it in the twine. The ends are left long enough to be caught in two or more rounds of the weft. *c*, At the appropriate place, two warps (1 and 2) are cut off just beyond a twined row. The weft row is continued and when it reaches the side of the left marginal weft (3) it is turned back to the left. It continues the round parallel with its previous course and reaches the right marginal weft (4) when it is turned back to the right. It has now balanced the spacing on the left. It continues in the orthodox spaced weft round until it again arrives at the gap to the right of warp (3). Two new warps (1' and 2') are now included in the twine to fill up the gap between the warps (3 and 4). The weft continues on in the spiral rounds as the warps have again reached the normal number and the opening (5) has been formed.

The finish. The decreasing diameter of the twined rounds of the body are so arranged that when they reach the outer end of the *mata* funnel, the

two sets of warp elements come together. The two sets of warps are united (*ao*) by a series of close twined rows as in figure 266.

Transverse lashings (*fa'amau*) with pieces of vine around the last set of four or five weft rounds are made by passing the turns around the rim above and a twined row below. They are tied with the ordinary half hitch, or two half hitches, and the end tucked in under the turns. The lashings are spaced to about seven in all and some are continued on from the preceding one by carrying the vine across. The lashings prevent the last twined rows from working over the ends of the warps which are cut off about 2 inches from the last twined row. (See Plate XLIV, *A*.)

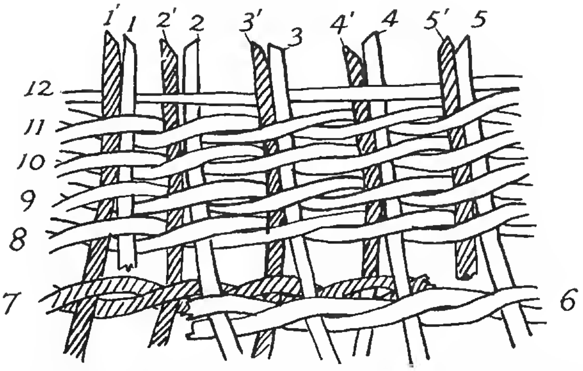


FIGURE 266.—*Fanga uli* trap, end finish. The twined row (7) is the last row of the funnel while the row (6) is now the last independent row of the body. The body warps on the left are cut out to show the funnel row and the same is done with the funnel warp (5') on the right. The two twined rows overlap. The warps of the funnel and the body which are the same in number are pressed close together in pairs as shown. The body weft now continues on its spiral around and includes each pair in the one half turn of the weft twine as in the row (8). This bringing together of the warps is termed *ao*. The weft twine is continued on for four complete rounds (8 to 11) made as close together as possible. On completing the last round (11) one weft element is cut off and its end tucked behind one of the warps. The other element makes a last round (12) by itself, passing alternately in front and behind the warp to end by being cut off and the end tucked away under a turn of the weft. The ends of the funnel wefts are also cut off and tucked behind warps.

The cover for the exit hole is made of two pieces of vine about 28 inches long which are crossed. Another piece of vine is doubled around one of them and worked in flattened circles with a single pair twine with increasing rounds to form an elliptical-shaped cover. As the twine reaches the cross pieces, it encircles them with a half turn. When the cover reaches the dimensions of 11 by 9 inches, the weft ends are tucked in under some part of the twine. The cover thus has four pieces of vine sticking out. The ends are sharpened. When the cover is applied over the exit hole, the vine ends are pushed down under the twining of the trap. Two stout pieces of vine about 20 inches long

(*tao 'api*) are crossed over the ends of the cover and their ends stuck under the warps on either side. This pegs down the door securely.

A loop handle (*salatau*) is made by doubling two pieces of vine around the *mata* rim, twisting them together, to form a loop, taking more turns with the individual vines around the rim, and knotting them with half hitches.

The trap obtained was in use at Sapapalii in Savaii where this type of trap is made. It is set inside the reef near some standing rocks (*ma'a tu*) with the exit opening above. After propping it in position with rocks and coral, *amu* (branching coral) is put over the top to disguise the trap. The wet trap is very heavy and if there is a good catch, it is hauled up into a canoe by a rope tied to the handle. The fish caught are *funga, ponge, malau, male'i mutalau, lo,* and *ngatala.*

A large trap (*fanga tapi*) of *tuafanga* vine is made in Savaii in the same shape as the lobster pot type (*fanga i'a*).

BAMBOO DOUBLE ENTRANCE TRAP

The bamboo trap (*fanga'ofe*) resembles the *fangauli* trap in shape and principle but the stroke technique is an improvement on the wrapped twine used in *'enu* traps. The inner tube has a middle partition with an opening on either side of it and the funnel-shaped entrances connect the tube with the ends of the body.

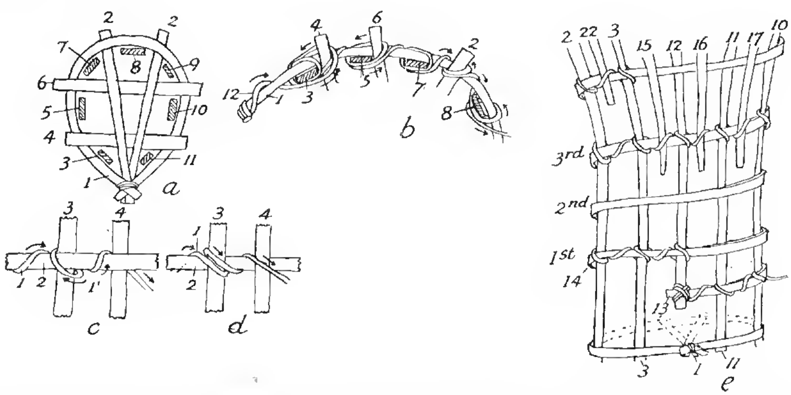


FIGURE 267.—Bamboo *fanga'ofe* trap, commencement of inner tube and funnel: *a*, a bamboo strip (1) is bent into a hoop with a horizontal diameter of 4 inches. Two upright bars (2) with the upper ends diverging and the lower ends together at the hoop crossing below are lashed together below. Two crossbars (4, 6) and seven bamboo strips 41 inches long to form tube and funnel warps (3, 5, 7, 8, 9, 10, 11) are placed as shown, the warps being on the inner side of the hoop. The four pieces (2, 2, 4, 6) form the partition of the tube. *b*, The warps and partition pieces are lashed to the hoop, by bringing the bamboo binding element (12) from the hoop lashing below to act as the active element of a weft combination of which the hoop is the passive part. As all the elements in the trap consist of bamboo strips the active element of the weft will be referred to as the *weft* and the passive element as the hoop. The weft (12) takes a turn around the

hoop and taking the warp (3) and the bar (4) as one, it makes a complete turn from the inner side around the crossing made by these elements with the hoop and a second turn around the warp (3) alone. Beyond the bar (4) the weft takes a turn around the hoop and from the inner side makes a complete turn around the warp (5), the bar (6) and the hoop. Passing around the hoop beyond the bar (6) the weft makes a complete turn singly around the warp (7) the bar (2) and the warp (8). The technique is continued around the hoop until all the warps and bars, either singly or in twos, have been lashed to the hoop by one complete turn of the weft. *c*, Outer surface, wrapped twine. The warps (3, 4) are on the under side of the hoop (2). The weft (1) makes a half turn over the hoop and crosses the warp (3) from above downwards on the under side. Emerging from under the hoop, the weft makes a turn from below upwards and to the left over the hoop. It again crosses the warp on the under side and by so doing makes a complete turn around the hoop and warp crossing. It makes a half turn (1′) over the hoop from below and crosses the under surface of the warp and hoop crossing and continues the like technique with succeeding warps. *d*, Under surface, wrapped twine. The two turns on the under surface of the warp (3) are the result of making a full or complete turn around the crossing. The weft has crossed the warp (4) and requires it to be brought around the hoop on the other side to complete the full wrapped twine technique. *e*, The warps (3, 11) are those at the bottom of the tube on either side of the hoop join (1). The space between the warps (3 and 11) is wide and a fresh warp (12) is spaced between them with its end 3 inches from the partition. The end (13) of the passive hoop element of the weft consisting of two strips of bamboo placed together is laid above the end of the new warp (12) and lashed to it with the active weft. The weft now lashes the hoop to the warps (11 and 10) by the full wrapped twine and continues on in spiral form until it (14) reaches the commencing warp (12), when the first round is completed. The wider space between the warps (3, 11), the partition, and the end of the warp (12) forms the entrance opening for fish (*ala i'a*). The warps average 1.25 inches apart and the space between the weft rounds is the same. Three complete rounds (1st-3rd) are made but just before the weft reaches the warp (12) a new warp (15) is added by laying its end on the outer side of the hoop and fixing it with the ordinary half turn that the weft makes over the outer side of the hoop. The tube warp (*'aso tapua*) which comes next (12) is wrapped with a full turn. As the weft makes its next half turn to get into position, another new warp (16) is laid on the outer side of the hoop and fixed by the half turn. The next tube warp (11) on the under side of the hoop is fixed with a full turn and the new warp (17) added on the outside with a half turn. The technique of expanding the funnel therefore consists of adding a new warp in each space between the old warps. When the hoop comes around to warp (3) the new warp (22) will complete the set of 8 new warps added to the 8 original tube warps, increasing the expanding funnel to 16 warps. The 16 warps are divided into a lower series which is lashed to the hoop by full turns of the weft and an upper or outer series fixed to the loop by half turns.

The material used throughout is bamboo. The warps are formed of split bamboo ranging from 0.3 to 0.5 inches in width. The weft passive element, also of split bamboo, ranges in width from 0.5 inches at the ends of the trap to 0.8 inches in the middle. The active wrapping element of the weft consists of the outer skin of the bamboo prepared in thin strips about 0.2 inches wide.

The trap commences with the partition and inner tube. (See figure 267.)

The further technique of the funnels, body, and exit opening with its cover are described under figure 268.

A *fanga'ofe* trap (Plate XLIII, *B*) was obtained at Fasitoouta, Upolu. They are set like the *fangauli* but are not greatly in favor as they rot easily. They are much more easily made than the *fangauli* and their use is probably

also influenced by available material. In principle, they follow the *fangauli* trap but in stroke technique their affinity is with the *'enu* traps.

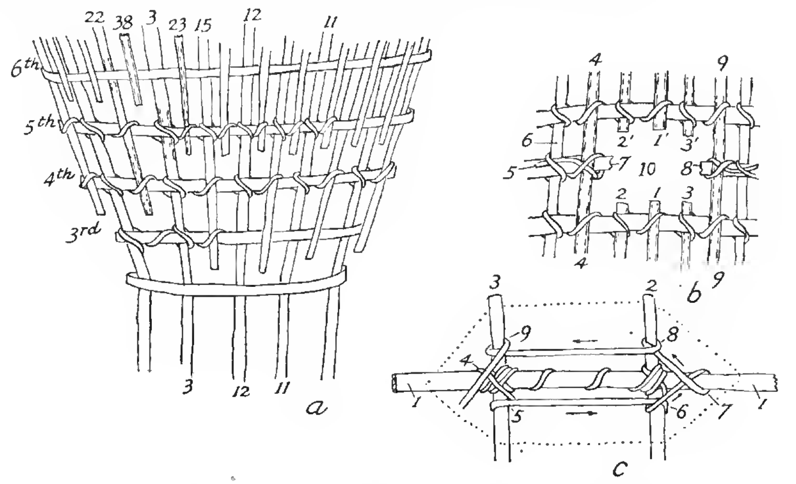


FIGURE 268.—The *fanga'ofe* trap, technique of funnel, and exit opening: *a*, from the warp (22) last added (fig. 267 *e*) the weft makes another spiral round, with the inner and outer series of eight each, until it reaches the warp (3) on the next spiral round (fifth) which completes a round from the last new warp (22). The interwarp spaces have diverged so another set of 16 warps is added, one to each space and on the outer side of the loop. As the balance between the outer and inner series has to be maintained, the hoop is first lifted up to the outer side of the 16 warps already attached so that the 8 new warps which started on the outer side of the hoop will join the 8 original tube warps on the inner side and thus balance the inner and outer series with 16 warps each. Hence the new warp (23) is added on the outside under a half turn, while the next warp (15) which started on the outer side is now on the inner side of the hoop and is consequently fixed with a full turn of the weft. The weft stroke is the same throughout the outer series of warps being fixed by a half turn and the inner warp by a full turn. When the spiral comes around (sixth) to the inner warp (22) the addition of the new warp (38) to the outer side of the hoop, completes the new series of 16 warps of the outer series. The lashing technique is shown in the lower rounds but is omitted in the upper rounds of the figure to demonstrate the relative positions of the two series to the hoop. The wrapped twine is continued with the two series of 16 warps each for 3 rounds when the outer diameter of the funnel is attained. The hoop is run in close to the preceding turn and lashed to a warp. The other end of the tube, with the lower opening (*ala i'a*) and the expansion of the funnel is exactly the same as that described.

The body of the trap is formed of 42 warps. The body hoop in its first round is placed close above the funnel marginal hoop. The first body warp is placed on the inner side of the hoop and also passes under the funnel hoop. The warps are added alternately to the inner and outer sides of the hoop with the established technique of a full weft turn around the inner warp and a half turn around the outer. At short intervals, after making a full turn around an inner warp a second full turn of the weft is made around the funnel marginal hoop to lash the body commencement round to the funnel throughout its circumference. On completing the first round, the hoop is diverged and the spiral technique continued with the 42 body warps in two series with the space between the hoop rounds ranging from 1.5 to 2 inches. On reaching the middle of the body, the exit opening is formed on what will then be the upper part of the trap. *b*, An outer warp (1) and an inner warp on either side (2, 3) are broken off just beyond the lashed hoop. When the

weft comes around to the warp (4) forming the left margin of the gap, the weft (5) is crossed under its own loop and pushed back under the turn around the preceding warp (6) to fix it. The hoop (7) is broken off. The right marginal warp (9) is an outer warp, so the hoop round is continued by laying the hoop (8) under it, lashing it with the weft and continuing the hoop spiral as if no break had occurred. When the hoop arrives again at warp (4), an inner warp (2′), an outer warp (1′) and another inner warp (3′) are added to the hoop to repair the break in warp continuity. The exit opening (10) is thus defined. The middle part of the body which has gradually bulged out owing to the gradual increase in interwarp spacing is now gradually decreased by lessening the warp spacing until when it reaches the other funnel rim, the body diameter coincides with it. As the warps are being lashed to the last hoop round, the weft binds the body hoop and the funnel hoop together in the same method as at the other end. When the round is completed, the weft is tied, the hoop cut off, and the projecting ends of both body and funnel warps trimmed level about 1.5 inches from the last hoop round. The other end is similarly trimmed. *c,* The cover (*'apa*) of the exit opening is made of a stout bamboo strip (1), 19 inches long and 0.75 inches wide. Two narrower pieces, (2, 3) about 9 inches long are crossed on the long piece 3 inches apart. The cross piece (2) is lashed at the crossing with a bamboo strip. In commencing a binding with bamboo, the end is laid on the material and simply crossed by the diagonal turns made. The strip is run spirally over the stout piece to the left where it lashes the cross piece (3) in position. The binding strip then takes a turn (4) around the outer side of (1) descends obliquely and takes a turn (5) around the lower end of crossbar (3). Thence it crosses horizontally to make a turn (6) around the lower end of the other crossbar. It passes obliquely upwards to pass around the right end (7) of the long piece, upward to make the turn (8), horizontally to (9), and completes the round on the left. From here it makes six more complete rounds, each external to the other. The end of the last round is poked under a previous turn. The cover is put on by placing the long piece longitudinally over the middle line of the hole and sticking the ends in under weft rows of the body. Two other strips of bamboo are crossed transversely over the ends of the cover and their ends stuck in under warps.

The full turn made with the weft around the inner warp distinguishes the wrapping technique from the more simple wrapped twine of the *'enu* traps, in which the half turn is made over the inner warp as well as the outer. The *'enu* twine may be termed a "simple wrapped twine" and the *fanga-ofe* twine as a "full-wrapped twine." The full-wrapped twine is used in the *anga* double entrance traps of Aitutaki, Cook Islands (39, p. 310).

SEA EEL TRAP

The sea eel trap (*fanga pusi*) consists of a shallow rectangular box made of vertical and longitudinal sticks lashed together with sennit braid and has a self-acting entrance at one end. (See Plate, XLIII, *C*.) The making of the box and the lashing technique is described under figure 269.

The self-acting mechanism of the trap has to be placed in position before the top of the box is lashed on. It consists of two parts; a wooden entrance tube and an inner part formed of coconut fabric. The wooden tube is dealt with in figure 270.

The inner part of the self-acting mechanism and the closing in of the upper part of the box with provision for an exit opening is described under figure 271.

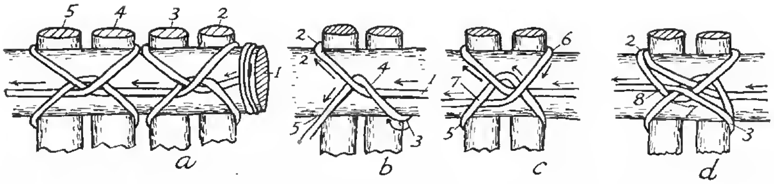


FIGURE 269.—Lashing of sea eel trap (*fanga pusi*). The type specimen figured is 22 inches long, 13 inches wide and about 5 inches deep. The wooden rods forming it vary from 0.3 inches in diameter at the ends to 0.5 inches at the sides and bottom.

The bottom is formed of 22 rods each 20 inches long. There are four crossbars 14 inches long, one at each end and two intermediates evenly spaced. The crossbars are laid across the longitudinal rods, which in position total 10.5 inches in width, and are arranged to project evenly on either side beyond the edges of the longitudinal rods. The bars are tied to the rods in pairs with two half hitches passing diagonally round the crossing of the rod pair with the crossbar. *a*, The cross bar (1) is shown tied to two pairs of longitudinal rods (2, 3, and 4, 5). One end of the braid has been fixed to the end of the bar and after one pair of rods is lashed, the braid goes on to the next pair. *b*, The braid (1) descends on the middle line of the crossbar and turning to the left far corner (2) makes a diagonal turn around the back of the two rods, reappearing of necessity, at the right near corner (3). It forms the first diagonal half hitch by passing over and then under the first loop at (4). *c*, The second diagonal half hitch must take in the remaining two corners. The braid therefore passes around the left near corner (5) passes obliquely around the two rods and appears at the right far corner (6). From here it crosses the middle to pass through its own loop at (7) and thus form the second half hitch. From here it passes on to deal with the next two rods in the same way and so continues until all the rods are lashed to the crossbars. *d*, Sometimes a third half hitch is taken around the two rods before passing on. This makes two half hitches in one direction. After forming the second half hitch in the last figure, the braid, instead of passing on, makes a half hitch in the opposite diagonal to the last made. The braid, therefore, turns from the last hitch at (7) to the left far corner (2). From there it passes diagonally over the back of the rods to appear at right near corner (3). From here it of necessity passes over the other turns to pass under its own loop at (8) to complete the third half hitch. The three hitches are used where extra strength is required.

The sides are formed of 8 longitudinal rods, 22 inches long and covering a width of about 4 inches. Four crossbars are used, the two end ones being 5.5 inches long and the two intermediates, 4.5 inches long. The end bars are placed so that when the sides are fitted to the bottom, they will be just external to the end crossbars of the bottom. This is rendered possible by the side rods being an inch longer at each end than the rods of the bottom. The bars are further arranged that the intermediates are flush with the top edge so that they project half an inch beyond the lower edge or what is to be the lower edge. Their situation is further arranged that the projecting lower ends will rest against the sides of the projecting intermediates of the bottom. The end bars also are arranged to have a half inch projection above and 1 inch projection below. The lashings are made with two diagonal half hitches. The two ends are slightly different as the front end has the entrance hole. The back end consists of 26 short vertical rods nearly 6 inches long lashed to a fairly thick crossbar (0.6 inch diameter) at the bottom, a thinner crossbar at the top and one intermediate about an inch below the top bar. The two lower cross bars are 12.5 inches long and the upper top bar, 13 inches. As the 26 vertical rods cover a width of slightly over 10 inches, the crossbars project well out on either side to afford supports for lashing the sides.

The front end is slightly wider, the crossbars being 14 inches long. It is also slightly deeper, the vertical rods being 6.5 inches long. Besides the top and bottom crossbars, there are two intermediates, the upper being less than 0.5 inch from the bottom bar in

the middle and less at the ends. The upper intermediate ends flush with the sides of the vertical rods but the other three project as at the back.

The entrance hole is formed in the middle between the two intermediate crossbars by cutting the vertical rods as shown in figure 270 *b*. The hole supports the outer end of a tube composed of wooden laths. The hole narrowed by the tube end is 3 inches in diameter transversely and a little over 2 inches vertically. The box part of the trap is assembled by turning the bottom with the crossbars underneath and then fitting the sides and ends to it with their crossbars to the outside. The projecting ends of the crossbars are lashed together where they fit against each other both at the bottom and the sides. Three thick longitudinal rods are lashed on the outside to the crossbars of the bottom, one at either side and one in the middle. These project for 7 inches beyond the front end of the trap. They afford extra support for lashing at the sides and form a rest to protect the close lashings of the bottom rods from wear against the rocky bottom on which the trap is set. To the long ends of the 3 undermost longitudinal rods a crossbar is attached as a handle. (See Plate XLIII, *C*.)

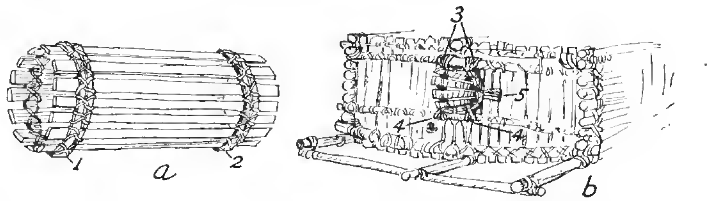


FIGURE 270.—Sea eel trap, formation of entrance tube: *a*, the wooden tube is formed of 14 wooden laths, 7 inches long, 0.5 inch wide and about 0.2 inch thick. A thin flexible hoop of wood (1) is run around the latter about 0.25 inches from the ends. The laths are then fastened to the hoop singly with the diagonal two-hitch knots described. Another hoop is run around the other end where the tube is slightly narrowed (2). *b*, The outer end of the tube is fitted from the inside to the opening in the front end of the box. The hoop fits close up against the inside of the end wall and the 0.25 inch ends of the laths fit against the circumference of the opening. The tube is flexible and adapts itself to the opening. Two firm lashings (3) are made around the upper intermediate crossbars and the tube hoop while two similar lashings (4) are made around the hoop and the lower intermediate. A side lashing (5) is also made around the hoop and two vertical rods on the right of the opening. These fix the tube firmly in position at its outer end which is sufficient to keep the tube elevated off the bottom at its inner end.

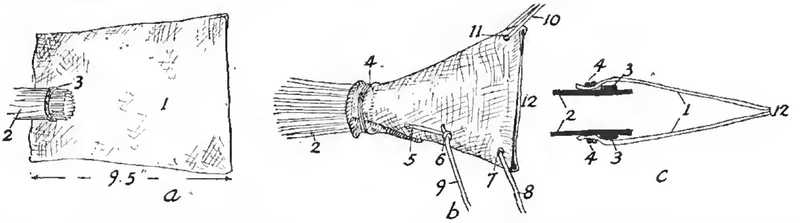


FIGURE 271.—Sea eel trap, self acting mechanism: *a*, A sheet of *lau'a'a* (1) 9.5 inches long and about 14 inches wide is placed under the inner end of the tube (2) with its front edge in front of the rear hoop (3). *b*, The far edge of the sheet is folded over to meet the near edge and the front part is carefully folded in tubular form around the tube. It is then tied (4) in front of the rear hoop to prevent it from pulling off. The long end of the lashing braid is carried back under the sheet and brought up through a hole cut through both layers of the sheet at (5). Another hole is made through both layers at (6), the braid passed through and again brought up through both layers at (7). The long end (8) is then drawn back obliquely and tied to the side of the trap. Another

piece of braid (9) is tied to the braid at (6) and also run obliquely back to be attached to the side wall. A piece of braid (10) is run through a hole made at (11) and tied obliquely back to the other wall. The braid end which passed through the holes (5, 6, and 7), stitched the free edges of the sheet together. The sheet which formed a continuation of the tube at its front is flattened out at its rear end into a narrow transverse slit (12) 7 inches long and its maintenance kept up by the oblique outward pull of the braid cords (9, 8, and 10). They also keep the end hanging above the bottom. In any case as there is no stiffening hoop to continue the tubular commencement, there is a natural tendency for the material to flatten out. *c,* A longitudinal section of the inner part of the tube and the fabric part with the same numbering as *b,* shows how the tube flattens out.

The top of the box is now made with two longitudinal crossbars and transverse rods. The two bars are fitted so that they will rest on the inner side of the side walls. The lashings are made leaving a gap in the middle of four inches by not adding any transverse rods in that part. The top is then turned over to place the marginal longitudinal bars on the under side. A mesial longitudinal bar is then lashed to the rods in the true upper surface. Two side longitudinal bars are also added to the upper surface and merely lashed here and there. The top is fitted in position and the projecting ends of the longitudinal bars lashed to adjacent projecting ends. The trap is now complete except for a door to close the upper opening.

The upper opening is the exit opening for extracting the fish. Some wide slats of wood are made and thrust in under the three upper longitudinal bars. They rest on the sides like the other rods forming the top and the longitudinal rods keep them down. As many are made as will close the gap. The trap is baited and the door slats are tied to the middle longitudinal bar.

The trap is set in the lagoon for sea eels. Attracted by the bait the eel finds the trap and enters the tube. When it reaches the fabric part it easily pushes its way through the slit opening, which readily widens in a vertical direction. Once the eel is in, however, it cannot find, let alone pass through, the slit from the inner edge side. The slit is in space and the fish keep going around the sides. The trap mechanism thus acts like a valve which can be passed through from one side by pressure but falls back after the pressure is removed. It is simple and ingenuous and marks a departure from the rigid inner openings of the other self-acting traps.

The material used in the trap described is wooden sticks. The *lafo* creeping plant with a cane-like stem, used in sugar-cane thatch sheets, is also used for sea eel traps. The old style of trap is rapidly disappearing as ordinary wooden boxes of sawn timber, nailed together, are much easier to secure and prepare. Numbers of such traps were in use in Tutuila and Savaii. The trap secured was obtained at Fasitoouta in Upolu. The dome cylinder type of *'enu,* the bamboo double entrance trap, and the sea eel trap were obtained in Upolu after efforts in eastern Samoa and Savaii had failed.

NETS

Nets have the general name of *'upenga.* The craft of netting is old, as denoted by the sayings associated with the ancestor Pili: O le 'upenga o Pili a tautau ae fangota (The net of Pili hangs up but it catches fish).

Pili did his netting at night and thus, though people only saw his net hanging up in the daytime, it nevertheless caught fish. Another saying conveys the same idea: O le 'upenga o Pili e fili i le po ae taḷa i le ao (The net of Pili is bundled up at night but spread out during the day).

The net was spread out during the day to dry but at night it was bundled up for transport down to the sea. Thus Pili did things quietly and unobserved without seeking public assistance.

The net is also mentioned in the early days of Tangaloa-ui for it was with a net spread over the mouth of a cave in Tau that he intercepted Sina Sasaumani on her return from bathing. An old man on Tau also said that there was a net associated with the Sasaumani but all he could remember of it was the method of introducing extra meshes.

NETTING MATERIAL

The method of preparing netting cord has been described. The best material is *fau songa*. Turner (41, p. 167) states that nets were mostly made in the inland villages. This is due to the *fau songa* growing in greater quantity inland. On occasion the *fau tu* was used. For special nets, breadfruit bast, paper mulberry bast, and sennit braid were used. Thicker sennit ropes in three- or five-ply braid were used for the upper and lower ropes of long nets.

A needle (*si'a*) and mesh gage (*afa*) were used. The netting needle, according to Manuan authorities, originally consisted of a stick about a foot long with a blunt point which was split. The cord was rolled in a ball and the end placed in the needle cleft. No detail could be given as to how it was used. The general idea resembles the *kioe,* an instrument used by the Hawaiians for mending, but in which there is no split point. The needles now in use (Pl. XLV, *A,* 1) are similar to those in use in other parts of Polynesia. They consist of a long flat piece of wood expanded at either end to allow for mesial longitudinal slots with narrow slits through the blunt pointed ends. The cord is wound longitudinally between the two slots. The needles are made in various sizes to suit different sized meshes, as the loaded needle must pass through the completed mesh.

The *afa* gage is a flat rectangular piece of wood scraped smooth, with rounded edges, and of different sizes. (See Plate XLV, *A,* 2.) Bamboo is a favorite wood as it is easy to shape. Pratt (23, p. 17) gives *afa* as meaning united in action in the phrase *'ua afa fa'atasi* (from the same mesh stick). Hence, also, the saying, "Ua afa fa'atasi taofi 'uma, 'ua lelei lea mata'upu." (When all the opinions are from the same mesh stick, that matter is settled.)

TECHNIQUE

To commence a net is *alu* and the mesh is *mata'upenga,* or *mata* for short. To *lafo* is also to make a net. The netting needle is loaded and the required

mesh gage selected. One end of the cord is wound around the gage twice and tied with a reef knot. The cord is unwound and the knotted loop forms the first mesh. Meshes are thus twice the size of the mesh gage. The short end of the cord beyond the reef knot is left long enough to tie to the first mesh to form a long loop to place over the big toe to steady the commencement. (See figure 272.)

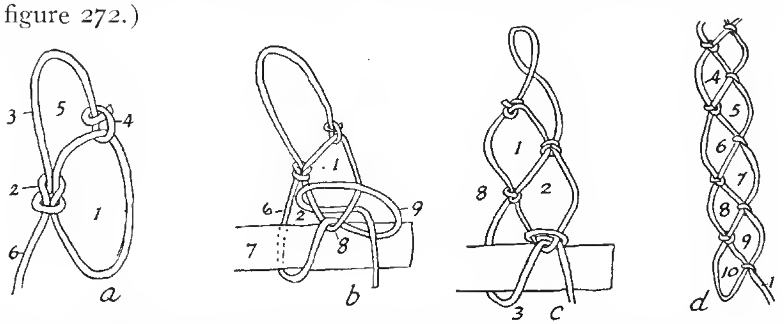


FIGURE 272.—Netting technique: *a*. the first mesh loop (1) is tied by the reef knot (2), the short end of the cord (3) is tied to the mesh loop (1) at 4 to form the toe loop (5) while the other end of the cord (6) is the part that is wound around the needle; *b*, with the reef knot (2) to the left, the cord (6) is pulled downwards and the mesh gage (7) placed over it in such a position that the lower end of the first mesh (1) rests on its upper border. The cord is doubled up over the lower edge of the gage and the needle carrying it is passed through the first mesh (1). The slack of the cord is flicked to the right to form a loose loop (9) large enough to allow the needle to pass through it later. The needle is then carried over both limbs of the first mesh (1) to the left, then back to the right under them and up through the right loop (9).

The left hand holds the gage and the left thumb holds the crossing (8) against the edge of the gage so as to fix the size of the mesh. The right hand works the needle which, after passing through the right loop (9), is drawn taut so as to tie the netting knot at the lower end (8) of the first mesh (1).

In this manner, the second mesh is formed by using the true meshing knot. Note that the gage gives the dimensions of the lower half of the mesh while of the upper half, the limb on the left is formed by the cord descending to the upper gage edge while the right limb is formed by the previous mesh. The gage is always placed over the descending cord so that the descending cord passes through the mesh from before backwards and the loop with the slack is always flicked out to the right. Netting consists of a repetition of this simple technique. *c*, The third mesh is added in a similar way but as the left hand holds the gage and the last netting knot is to the right, it is easier to twist the last knot (8) over to the left. The gage is then placed over the descending cord with its upper edge resting against the lower end of the last mesh (2). The cord is drawn upwards as before and the needle passed through the second mesh (2) and the knot tied in the way described to form the next mesh (3). *d*, The meshes are added, always keeping or twisting the last knot made to the left and then adjusting the gage. The meshes appear as in the figure and the adding of meshes is continued until the depth of the net is secured. The cord (1) instead of being tied to the last mesh (10) is left as it is for the next stage.

Good netting depends on the evenness of the meshes. After the needle is passed through the mesh above, the cord is pulled or slackened until the crossing is in the right place on the gage, when it is fixed by the left thumb while the netting knot is made.

The depth obtained forms one end of the net and is referred to as its *lautele*. The *lautele* of various nets is distinguished by the number of meshes. The length or *'umi* is obtained by adding successive rows of the same number of meshes to the end which has been set up. The method of forming the commencement strip of netting has resulted in two rows of meshes. Meshes are really quadrilateral figures with equal sides. Owing to the nature of the material, if they are pulled in one direction, they lengthen in that diameter and narrow in the other. In making the net, the pull is at right angles to the gage and the long diameter of the mesh is naturally in the same direction. To lengthen the net, the commencement strip instead of being longitudinal to the netter is placed transversely before him. The pull now comes on the other diameter but, the meshes having equal sides, it makes no difference to the technique and the placing of the gage. (See figure 273.)

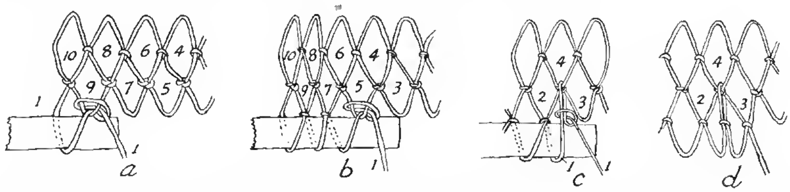


FIGURE 273.—Netting technique and additional meshes: *a* and *b*, increasing length; *c* and *d*, additional meshes. *a*, The net strip from the position in figure 272 *d* is now laid transversely with the cord on the left and the pull being changed the appearance is as shown. The gage is placed over the cord (1) and the first mesh made by engaging with the mesh (9). The first mesh formed has a free margin formed by the cord descending to the upper edge of the gage and passing behind it. *b*, When the first mesh of the new row is tied, it is not now necessary to remove the gage from it. The gage is simply pushed along under the next completed mesh above. From now on, it will be noted that the last knot tied is on the upper edge of the gage. The cord (1) is simply passed behind the gage brought up over the lower edge, the needle passed through the next mesh (3) and the usual knot made. Thus after the first marginal mesh of the new row, each mesh is formed by the sides of the meshes above while the cord simply adds the lower half of the mesh. The same number of meshes are made as in the row above. The netting is then twisted over to bring the cord back to the left and another row commenced. The successive rows are added until the length required is finished. See Plate XLV, *A*, 3. *c*, Instead of carrying the cord (1) from the last knot (2) to the next mesh loop (3), the needle is passed through the loop above (4). The cord is brought down to the mesh gage and tied to the ascending cord with the usual netting knot as shown. *d*, The needle is now passed through the next mesh (3) and the netting knot tied. Thus between the knots (2) and (3) there are two meshes instead of one.

In bag nets, any narrowing may be obtained by dropping meshes in the various rows or by using smaller gages. Extra meshes, however, were seen in a hand scoop net at Tau. These were the meshes said to be derived from the net of the Sasaumani, an early fishing community who were on Tau when Tangaloa-ui grew to man's estate. The knotting of the extra mesh is seen in figure 273 *c, d*.

The Tau people called the mesh *mata 'upenga a Sasaumani*. The Tutuilan

and Savaiian people did not know it. In fact a Savaiian expert thought it was Chinese. As, however, the same mesh is used in New Zealand, it is probably old.

Cords and ropes. Most small nets have a cord running through the marginal meshes by which the net may be attached to wooden frames or handles. The cord may be twisted cord or sennit braid. In long nets of the seine type, there is an upper and lower rope usually run through the marginal meshes. The upper rope, because it supports the wooden floats (*uto*), is termed *'afauto* or *u'a o le uto*. The lower rope is the *'afavae* (*'afa*, rope; *vae*, foot) or *fauvae*. To thread in the ropes through the meshes is *timata*. The lower rope may or may not have sinkers attached.

Floats. Casting nets, short nets set across channels and around rocks, and the long seine nets have floats (*uto*) attached to the top line. The floats usually consist of *tou, fau*, or other light wood. The floats are attached directly by the top rope, which is tied around them at intervals as it is threaded through the meshes. Floats are of two kinds; small peg floats and large floats.

1. Peg floats. Short lengths of about 3.5 inches in length of a light wood about 0.4 inches in diameter are tied to the upper rope with the knot shown in figure 274.

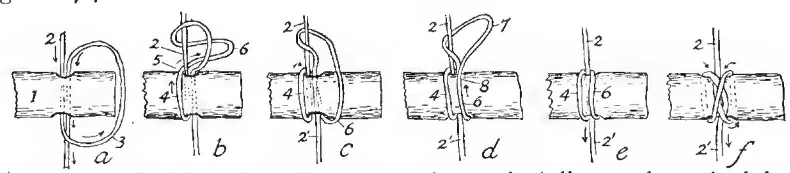


FIGURE 274.—Lashing of net floats: *a*, at the required distance from the left end, a float (1) is laid transversely over the top rope (2). A marginal mesh is drawn in under the float so that its cord rests between the float and the rope to be included in the knot. A loop (3) is formed with the rope and brought over the right end of the float into the middle line. *b*, The near end (4) of the loop is drawn taut against the float and passed upwards in the middle line to the *left* (5) of the standing rope (2) and the slack of the loop passed *under* the standing rope to the right (6). *c*, The loop (6) from the last figure is again brought over the right end of the float. In doing so it crosses the first turn made and the near part of the rope (2') beneath the float. The near end of the loop (6) is pulled downwards a little to remove excessive slack at the back. *d*, The loop (6) is carried upwards, close to the first turn and on its right. The left thumb is placed over it near the upper edge (8) to keep the turn in position, and the slack (7) is above the thumb. *e*, The near end of the rope (2') is pulled to remove the slack (7) in the last figure and the knot is complete. *f*, The view of the knot from below is shown opened out slightly.

2. Large floats. The larger floats are made of sections of larger branches which, being thicker, are naturally cut shorter than the long, slender peg floats. An average large float is about 3 inches long and 3 inches in diameter. A groove is cut around the middle transversely to give a grip for the rope. The rope may be threaded through the marginal meshes so long as the end

is not fixed, loops can be pulled up sufficiently large to tie the knot used with the peg floats.

Sinkers. Sinkers (*maene*) are used with the smaller nets, as stated above. In large nets, the weight of material against a rocky, uneven bottom would be a hindrance, let alone the nuisance of transporting the weight of clumsy material. Seine nets are not drawn in the way they are in other parts with a smooth sandy or muddy bottom. The large nets are usually set in position and for this purpose, it is easier to pick large stones from the bottom of the lagoon and place them on the bottom rope or just over it onto the meshes of the net. In a moving net, stone sinkers would catch against rocks and in clefts and seriously retard progress. It is easier in communal fishing for the numerous assistants to push the lower rope along the bottom with their feet in the method known as *tolovae*. When the rope catches on a rock, the men simply submerge and lift it over the obstruction, at the same time driving fish before them.

The sinkers used with lighter nets consist of two kinds: stones and shells.

1. Stone sinkers. Waterworn stones of round or oval form are used. They are attached separately to the bottom rope by separate pieces of cord. The two-ply twisted sennit cord is often used for this purpose. A short piece is first tied around the middle of the stone with the float knot described above and the ends then tied around the rope. These are spaced along the bottom. Though lead is superseding stone, it is surprising how much stone is still used. (See Plate XLI, *A*, 2.)

2. Shells (*pule*). Shells of the *pule* (*Cypraea*) kind are used with some nets. The closed rounded ends of the shells are cracked off so that the interior becomes patent. Cords can thus be passed through the long natural slit opening on the other side. For the method of direct fastening to the lower line see page 480. (See Plate XLVI, *A*.)

TYPES OF NETS

Nets range from small hand nets to long seine nets. A very characteristic net is one with a bag or purse in the middle with sides diverged out like the wings of a weir.

HAND NETS

Hand nets, shaped to a bag and attached to a wooden frame, with or without special handles, are made in various forms. They are used as dip or scoop nets and as manipulated traps.

The small dip net (*'upenga lama* or *lalama*), a small bag net attached to a single pliable rod, bent around through the marginal meshes into the form of a tennis racket with the ends tied together, was used in Manua with coconut leaf torches (*lama*) at night. They were largely used for fishing in the

lagoon. They are also used as dip nets with community methods such as the *lauloa* and stone weirs.

Edge-Partington (10, vol. 2, p. 44) gives a sketch of the type in which the overlapping ends of the frame rod serve as a handle.

The medium dip net (*'upenga sae'e*) seen on Tau serves the same purpose as the last but has a larger frame (*a'au*). (See figure 275.) It had been started from the bottom and increased by additional meshes of the *mata Sasaumani* type.

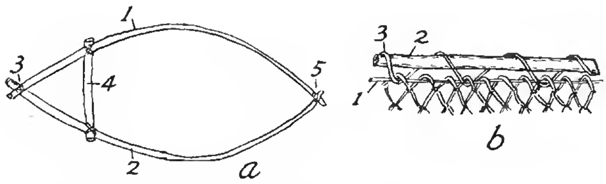


FIGURE 275.—Frame and net attachment of *'upenga sae'e*: *a*, the frame is formed of 2 rods (1, 2) tied together at the thicker ends (3). A crossbar (4) about 12 inches long is lashed to the side rods about 8.5 inches from the lashing (3) to spread them. The rod ends are brought together about 28.5 inches from the crossbar and tied (5). The frame is 16.5 inches across at its widest part. *b*, A bag net with a line (1) threaded through the marginal meshes of its upper circumference is attached to the frame (2) by another cord (3) wound spirally around the frame and the circumferential line. The net is 32 inches deep and narrowed longitudinally at the bottom to 23 inches.

In using the net, two men worked in conjunction. The man with the net set it across a likely looking channel while the other drove the fish toward it with a stick. The crossbar acted as a handle (*'au*). It resembled the Aitutaki *hopai* (39, p. 290) net frame on a smaller scale.

The long-handled dip net. The principle of the crossbar and the long handle is applied in the Cook Islands (39, p. 288) to nets for catching flying fish at night with the aid of a torch. Though on Tutuila, the use of the net and the torch was denied, the method was used in other parts. Though a Samoan proverb shows that torching took place, the present day Samoans are curiously confused about it. A Samoan talking chief quoted the following proverb: "'O sipa le lamanga 'ae ngase fua le malolo." (The torching was for *sipa* but the *malolo* was taken.) He could not distinguish between the *sipa* and the *malolo* flying fish, nor say what form of net was used with the torching. Pratt (23, p. 266) gives the *sipa* as a small flying fish. Thus, though torching for flying fish was known, it could not have been indulged in to the same extent as in the nearby Tokelau group and the Polynesian islands to the east. The net was probably of the type figured by Demandt (9, p. 46, fig. 1).

The double-handled dip net (*'upenga saosao'o*) is a net larger than the *sae'e* net but the distal ends of the frame rods are not tied together. One being used in Tutuila had a frame of two poles each 9 feet long. The

poles were tied together at the thicker ends to form a loose joint. The woods used for the poles were *auauli* and *talafalu*. The net which was attached along the poles for 7 feet was a bag net 5 feet deep and 4 feet wide at the bottom. The net is set across a channel or convenient pool by holding down one pole along the bottom while the other is held up to open the net. The two poles are easily manipulated by one man at the joint. An assistant armed preferably with a pole of light *ma'o* wood drives the fish into the net. The net possesses the advantage over the *sae'e* net with a rigid frame in that the poles can be closed together after the fish enter. The driving process is termed *so'a*.

In Tau, the net is called *'upenga tu uli*. The term *uli* (to steer) is used in the net name from the fancied steering of the poles of the net.

The scoop nets (*'enu*). The name *'enu* is shared by the midrib scoop used for palolo and the traps described on page 454. A more rigid framework is made by using rods for the bag of the net as well as the rim opening.

An *'enu* seen at Aoloau, Tutuila, had the opening frame made of a straight piece to which another piece bent into a *U* was attached. (See figure 276, *a* and *b*.) The net was used as a scoop for gathering the fish enclosed by a long net or *lauloa*.

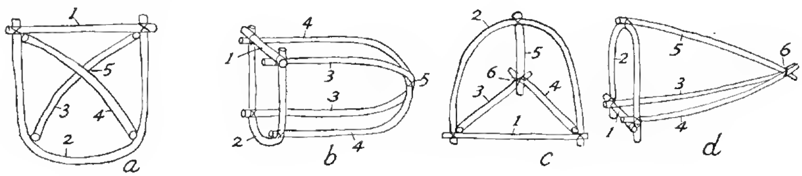


FIGURE 276.—Frame of *'enu* nets: *a*, front; *b*, side. The transverse rod (1) allows for an inside measurement of 2 feet while the *U* shaped piece (2) formed a vertical measurement of 2 feet 3 inches. Two other rods (3, 4) are bent into *U* shape and the ends tied to the inner side of the frame at diagonal corners so that the curved parts cross each other. The crossing (5) is lashed and is 2 feet, 4 inches in depth from the opening. The net is attached to the opening by a continuous cord run spirally around the rods and through the marginal meshes. (See figure 275, *b*.) The net is cut to suit the circumference of the frame round which it is wrapped. The edges are sewn together with a continuous cord and the net end is bunched over the end of the frame, gathered together and tied. *c*, Front; *d*, side. The straight bar (1) is about 36 inches long. The arch formed by the other rod (2) is 31 inches in vertical height. Instead of crossing two curved sticks to form the body, three sticks (3-5) about 45 inches long are used. The sticks (3-4) are tied to the inside of the lower corners while the third (5) is tied to the outside of the arch in the middle line. The far ends (6) are lashed together and a net attached to the frame as in *a* and *b*.

A similar *'enu* at Salailua was made in exactly the same way. The transverse rod of the opening was 40 inches long and always placed at the bottom. The inverted *U* rod tied to it formed an opening 36 inches high in the middle line. The two crossed curved rods were in this instance tied to the outer side of the opening frame and their crossing at the back called the *muli* was about

4 feet from the opening. The net with a 0.25 inch mesh was attached to the frame in the same way as the preceding *'enu* but at the back, another cord was run through the marginal meshes and drawn taut to pucker the net together to close the *muli* end. A cord was tied to the lower crossbar of the opening. This larger *'enu* was used in connection with the *tupa* leaf weirs described. The opening of the net was placed against the opening at the apex of the weir. It was wide enough to overlap the weir opening and it rested behind the two stones mentioned.

The fisherman stands outside the weir holding the cord attached to the crossbar. When the *i'a sina* fish have entered the net, the cord is pulled so as to lift the opening of the net above the surface of the water.

Another form of frame was seen in the same district as the above. (See figure 276,*c, d.*) The net is used purely as a scoop net in connection with long nets or it may be set in a small leaf weir in exactly the same manner as the preceding net. Not only *i'a sina* are caught with it but also the *atule* when it moves in shoals.

The arched hand net (*se'i*) consists of a rectangular piece of netting spread out by four sticks attached to each corner and tied together at the other ends in such a way as to arch them and thus keep the corners of the net taut. (See Plate XLV, *B.*) A line is run through the marginal meshes of one side and tied to the lower end of two sticks with a clove hitch. It is then run through the marginal meshes of each side in turn and tied also in turn to the lower ends of the other two sticks with clove hitches.

The lashed part of the arched sticks is used as a handle. The net is lowered down into the water and as a fish passes over it, it is drawn up out of the water. The fish caught with it are *matu* and *mumu.* It seems to be limited in distribution to the area in Upolu stretching between Apia and Fasitoouta. It is used in conjunction with a seine net termed *tolo matu.* The seine net is drawn round to enclose *matu* fish. Canoes paddle into the enclosed space and the sides of the canoe are tapped with the paddle. The fish swim in to the neighborhood of the canoe on hearing the sound and are then dipped up with the *se'i* net. The term *se'i* means to jerk and the name is applied to the net from the quick jerk given to it in drawing up the fish. The *se'i* is made at the same time as the *tolo matu* seine net and goes with it as part of the equipment. They are not supposed to be parted. Separating the two is prohibited (*sa*). The *se'i* secured was sold by the family whilst the family head was absent in Tutuila. The *sa* restriction was overcome by the vendors themselves.

The arched net with line (*'upenga sumu*) though not a hand net is dealt with here because it is exactly the same in make as the *se'i.* The one described in figure 277 was made for me by an old man at Tau who maintained

that they were so little used nowadays that he was the only man in Tau who knew how to make them.

The fish caught was the *sumu* (genus *Balister*) which frequents the outer side of the reef. Fishing took place from canoes which came in as close to the reef as possible. The baited net was lowered on a line to near the bottom. When the *sumu* bites at the bait the jerk is distinctly felt on the line. The net is drawn up quickly, the fish simply resting on the net without any attempt to get away. The net sags as it is drawn up and thus acts like a shallow bag net. A net of this type figured by Kramer (18, vol. 2, p. 170) and Demandt (9, p. 54) is shown attached to a float.

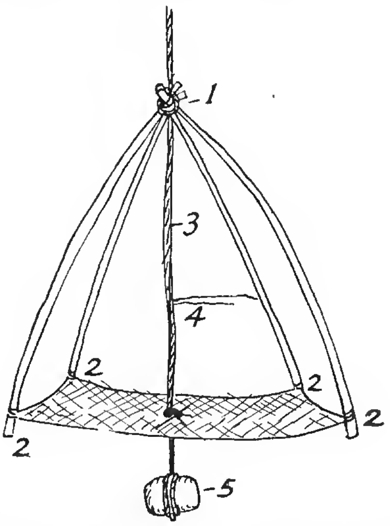


FIGURE 277.—Baited net (*'upenga sumu*): four thin rods about as thick as a lead pencil and 21 inches long were tied together (1) with sennit. A piece of two-ply sennit cord was then threaded through the marginal meshes of a rectangular piece of net 17 inches long by 15.5 inches wide and tied with a clove hitch round the lower end of each rod (2). Another piece of cord (3) was tied to the top of the handle (1) and passed down through the middle of the net. A piece of thread was used to tie the cord to a net mesh where it passed through. Another thread (4) was tied to the cord above the net for tying on the bait of a piece of coconut meat or crab. A stone sinker (5) was tied to the cord below the net. From the upper end of the rods (1) to the net was about 16.5 inches while the bait thread was 5 inches above the net.

The mullet hand net (*alangamea*) is the most interesting of the hand nets as it marks a novel departure in method. (See Plate XLVI, *B*.) It is used in catching mullet (*'anae*) as they jump over a seine net by which they are enclosed. The movement of intercepting anything in the air with a net is known as *seu*. The netting of pigeons is *seu lupe* and the *alangamea* use for catching mullet in the air is *seu'anae*. The framework is shown in figure 278.

When the net is not being used to intercept fish, the right pole is taken

out of the fork on the crossbar and placed beside the left hole which the joint admits of. The net is then wound around both poles. The net is carried folded until the fisherman takes up his position outside the seine net to *seu 'anae*. In action, the net is unwound and the right pole slipped by gradual firm pressure into the fork of the crossbar. The method of use is described later on page 484.

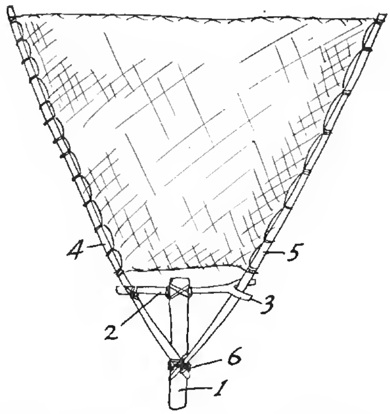


FIGURE 278.—Mullet hand net (*alangamea*). A crossbar (2) 1 inch in diameter and 32 inches long including a fork (3) is securely lashed to the tip of short stout handle (1), 1.7 inches in diameter and 28 inches long, with transverse, diagonal and circumferential turns with sennit braid in the same way as lashing a wall plate to a wall post. A 9 foot pole (4) 1.4 inches in diameter at its thick end, is lashed diagonally to the handle and the left end of the crossbar. A similar pole (5) has a groove cut around its lower end and is then tied to the handle and above the other side pole with a number of loops running one way round the groove. The lashing (6) is finished off with some circumferential turns around the lashing between the poles. The lashing forms a loose joint which allows the right pole to be stretched diagonally out towards the right and fitted into the fork on the crossbar. A net is now stretched between the poles. The outer ends of the poles, with the right pole in the fork, are 9 feet, 9 inches apart. The far end of the net corresponds to this length and the sides to the side poles to within 6 inches of the crossbar. The near edge of the net is 32 inches long where it stretches between the poles. The net is bagged to a depth of 38 inchs towards the handle end. The bag is called the *muli* of the net.

A sennit braid cord is threaded through the marginal meshes of the far end and tied to the end of each pole with a clove hitch so that there is a tight stretch of 9 feet, 9 inches between them. The braid ends are continued down through the marginal meshes of the sides of the net with a half hitch turn round the poles every here and there. They are then knotted to the poles at the near ends of the sides of the net which is 6 inches from the crossbar.

The shrimp net (*'u'uti*) is much used in the Vaisingango stream near Apia for catching fresh-water crayfish (*ula vai*). (See Plate XLVI, *A*.) The net has a small mesh (0.4 inches) and consists of a straight piece of net attached to side handles which are straight sticks 0.5 inches in diameter and 44 inches long. The bottom line of the net is tied to the lower ends of the sticks and when stretched apart with the net and sinkers on has a spread of about 5.5 feet.

The top line is tied to the sticks about 7 inches from their top ends and has a lesser stretch of 4 feet, 4 inches, thus giving the net a slight bag. On the bottom line of the net are the sinkers of *pule* (*Cypraea mauritiana*) about 2 inches wide at the opening. The closed ends of the shells are cracked off so that the long slit opening appears on the other side. (See figure 279.) The bottom line is run up through the marginal meshes at the sides and at the top. The side lines are attached to the handles at intervals with separate pieces of cord. No floats are needed.

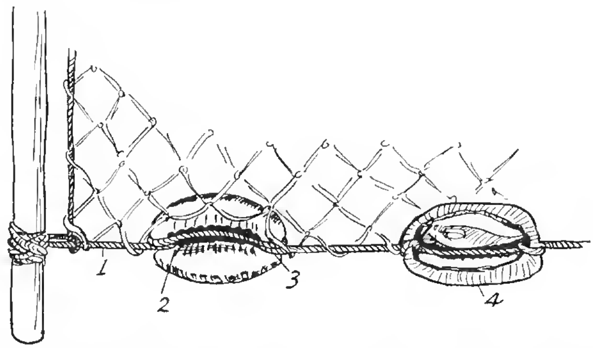


FIGURE 279.—Shell sinkers of shrimp net. The bottom line (1) is tied to one stick and threaded through the marginal meshes for about 2 inches. The line is passed through the opening of the shell (2) at one end and then takes a turn around its rim. It then passes across to take a turn around the opposite end of the rim (3). The long stretch of the line shows along the opening of the shell (2). The next shell (4) shows the loops round the back or broken part. The shells are attached about 2 inches apart and the net is threaded on the cord in the intervals.

The fisherman locates the crayfish and opens out the net holding the top end of the stick handles in each hand. The bottom line is then lowered behind the crayfish and, by sweeping the two sticks round to the front, the crayfish are enclosed. They can then be scooped back into the slack of the net and removed from the water. The inland villages of Mangiangi and Tanungamanono near the Vaisingango stream are places where the method is still used.

CASTING NET

The Samoan casting net (*'upenga tili*) consists of an ordinary straight net a few fathoms long and about 5 feet deep. (See Plate XLV, *D*.) It has an upper line with peg floats and a lower line with sinkers. In Olosenga the casting nets all had small sinkers of round waterworn stone but in most parts lead is now used. The success in casting depends on the way the net is gathered (*sangaio*) and held in the right hand. As it is too deep to manipulate, it is folded by turning down the upper third. The float line is held in the teeth to stretch the net to its full depth, while the left hand grasps the meshes

about a third down. The teeth let go and the float line thus falls down to form the right fold. The net is usually grasped by the left hand from the front when the float line falls backward when let go. The procedure may be reversed by grasping the net from behind and letting the float cord fall forward. Whichever method is commenced must be carried on to the end. The part of the net grasped by the left hand must then be transferred to the right hand with regular sequence and arrangement between the right fingers.

The right hand holds the right end of the net temporarily. The float line is seized between the teeth and the weight of the sinkers stretches that part of the net to its full depth. The left hand selects a part of the net a third from the top and transfers the part grasped to the right hand as the teeth let go. The first fold is brought into the right palm between the thumb and forefinger and held by the thumb closing down over it. The float line about 2 feet, 6 inches to 3 feet away to the left is brought in by the left hand and held by the teeth to stretch the net. The left hand again selects a spot a third down and transfers it to the right hand as the teeth let go. The second fold is passed into the right palm between the fore and middle fingers. The method of seizing fresh folds is continued with regular spacing to the left. Three folds are successively placed between the middle and ring fingers and three between the ring and little fingers. The closure of the fingers is sufficient to keep the folds in position. The last four folds are brought into the right palm on its ulnar side and held by closing the fingers over the palm. The arrangement of folds was 1, 1, 3, 3, and 4, commencing from the thumb side, but if the net is longer, the fisherman alters the number of folds to suit. He gets to know his own net. The number of folds may alter except between the thumb and forefinger which is always a single fold but the order between the fingers must be maintained. To form a circle with the throw, the two ends of the float line must be tied together. If the floats have been dropped backwards, the line must be tied forward or away from the body but if the floats have been dropped forward, the line must be tied at the back or towards the body.

Casting. The fisherman walks along the edge of the lagoon or wades in the shallow water until he sees a shoal of fish. Judging the distance, he swings the folded net backwards and forwards to gather impetus and then, with a curve, to the front of the body and back. From the back swing, he comes forward with the cast. As the hand goes forward, he turns it with the back upwards in pronation as he lets go. The sinker line spreads out in a curve which is restricted to a circle if the ends are tied. The fisherman who demonstrated the method on land, showed his skill by throwing the net over me. The net is thus thrown with a high trajectory into the air and falls fairly vertically round the mark. Subsequent practice showed that the throwing is quite simple if the net has been properly folded.

Some doubt has been expressed as to the *'upenga tili* being native Samoan. This is due to confusing the casting net described with the Chinese cast net which is closed at the top, like an inverted bowl. This is a permanent closure whereas the Samoan net is only tied with the float line when being folded. When cast it forms a ring of netting round the fish. The Chinese casting net has become popular in some parts of Samoa but is distinguished by being called *'upenga tili Saina* (*Saina,* China). Sometimes the casting net is thrown without the ends being tied.

The casting net gets the name of *tili* from the casting process. In Asau, Savaii, the net so used is called *'upenga mangingi* from its being used to catch the *mangingi* fish which gather in shoals. The net used is about 8 fathoms long and is folded as described above. There are two methods of casting: 1. *tili tongi* (*tongi,* to cast) the complete cast with the ends tied to form a ring; 2. *fa'asavangatunu,* after gathering the folds into the right hand, three are let go as a slack and the end held in the left hand without being tied. When the cast is made, the left end is let go at the last minute so that the net makes a pronounced curve beyond the fish. The fisherman starting forward after his cast drives the fish into the curve of the net. Pratt (23, p. 101) gives *fa'asavangatunu* as to fish with two nets, but in Asau no mention was made of a second net.

SEINE NETS

Lengths of net with float and sinker lines are used. They vary from short lengths of 8 to 10 fathoms to fairly long nets. The nature of the lagoon bottom over which netting takes place is so irregular from clefts, rocks, and coral outcrop that the usual hauling of a seine net cannot be carried out. Nets are therefore set and not hauled. They form barriers, weirs, or enclosures which prevent the escape of fish. They may be divided into short, winged, and long nets.

Short nets (*'upenga fa'alava*). Short lengths of 8 to 10 fathoms with pegged float lines and stone sinker lines were used in ordinary family fishing by a small party. At Leone, I assisted the Ripley family in this form of fishing. Two persons were stationed with a net which was spread across a channel. The channel is *ava* and the method of fishing by stretching the net across is *tu ava ava*. The fisherman dived down to see that the sinker line rested on the bottom and adjusted it into holes, depressions, and around rocks so that no openings were left below the sinker line. The other members of the family, spread out in a curve, worked down towards the net, splashing and beating the water to drive the fish into the net. On the way they subjected rocks to close scrutiny by diving down and feeling or spearing in the crevices. In this manner they caught several fish and others were driven into the net

where they were meshed. Every crevice and hole in the rocks was known to them. After the drive the net was taken up and carried across to another channel. The net, being short and light, was quickly folded at the float line and carried over the shoulder of one person. In this manner, the part of the lagoon adjacent to the family dwellings was worked over.

Short nets were also useful with the artificially made rock heaps. After driving the fish into the heaps, the net was run round it and the sinker line carefully adjusted to the bottom. The stones were then removed by dropping them outside the net line. The fish were speared or caught up in some form of scoop net and the surrounding net prevented their escape, some being caught in the meshes.

The casting net was used for the above purposes quite readily. When opened out across a channel or used round a rock heap, it was an *'upenga fa'alava,* but when folded and cast, the same net was an *'upenga tili.*

Winged nets. A characteristic net has a purse in the middle called the *muli* while the two ends are spread out to form a *V*. The net is set and thus forms a transportable V-shaped weir. It has various names. In Manua, it was described as an *'upenga tali* with a bag in the middle and two wings stretching out from it. The name *tali* (to receive) has an obvious meaning. In Savaii, it is termed *'upenga matalili'i* (small meshes) from the fact that the meshes are made small to prevent small fish escaping through the purse. A net examined in Safune, Savaii, was 36 feet long opened out. It had a pegged float line and stone sinkers. The middle 12 feet was doubled and the float lines and sinker lines tied together with a continuous cord to form a purse 6 feet long with 12-foot wings on either side. The net is shorter than the average and was used to catch the small fish among the *amu* branching coral. It was set in an appropriate place and the people worked towards it, breaking the coral with sticks in the *tu'itu'i amu* process. As the commonest fish in the coral is the *tu'u'u,* the net was referred to as an *'upenga tu'i tu'u'u,* which was merely a convenient way of describing its use.

A much larger net of this type was used at Fangamalo, Savaii, in connection with the coconut leaf *lauloa* method described. The floats were of large branch sections and there were no sinkers attached to the bottom line, large stones from the bottom of the lagoon being rolled over the bottom line when the net was set.

The large net made of breadfruit bast to be described on page 487 was also of the purse type.

Long nets. A long net at Aunuu island off Tutuila was 300 feet long, 5 feet 9 inches deep, with a 2-inch mesh. The round floats 1.5 inches in diameter and ranging from 3 to 14 inches in length were attached in the usual way to the top line about 16 to 17 inches apart. The sinkers were of lead. The net was termed *ulutulu* or *talaua'au.*

In Upolu and Savaii, a long net (*tolomatu*) is used in connection with catching mullet. A short one of 26 arm spans was seen hanging out to dry at Iva, Savaii. The drying sticks of forked uprights, about 4 feet apart, are *tautaulanga*. Two pieces were being joined together by running a cord through the marginal meshes of each end. A pointed stick of coconut wood about 3 feet, 6 inches long was used to gather the net on and was called an *'ausi*. The pointed end could then be stuck into the roof of the house and thus hang up the net.

At Moataa, Upolu, the nets were joined together to form a length of 60 arm spans. The nets were carried into the water on the *'ausi* stakes. Two stakes were used with a man holding each end of each stake. Owing to the large quantity of fish that come into the lagoon, and the length of net required, the fishing operation is a community one shared by the whole village. The net is thus made in sections by the community. At Puapua, Savaii, the rule is for each matai head of a family to make two arm spans and an additional span for each male child in his family. The sections were made well before the season opened and when needed were assembled and joined together. The float and bottom lines were run through the sections. The ends of the sections were joined as seen at Iva, or were simply overlapped slightly and tied to the upper and lower lines so as not to work apart. Mullet will not go through the net but endeavor to escape by leaping over it.

The nets are used to form an enclosure round the fish. The fish are actually caught with the *alangamea* net described on page 479. After the long net has been set across the direction in which the fish are moving, the fishermen, each armed with an *alangamea,* take up their positions outside the net and close together. The free end of the *alangamea* is held tilted slightly upwards towards the set net and the slack of *muli* bag part is held in the left hand. The fish are driven towards the set net and as they reach it, they jump over it and land in the scoop nets. The scoop is tilted up and the *muli* slack let go so that the fish slide into it. By bending the heads back, the fishes' necks are broken. They are kept in the slack until 8 or 10 are obtained, when they are emptied into *paopao* canoes which are close behind the fishermen. Some of the large scoop nets will hold 15 to 20 fish before they need be emptied. The process of catching the mullet in the air with the scoop net is called *seu'anae*. When the scoop net is opened out and fitted into the fork of the crossbar it is not tied in order that it may be quickly closed when carried to another position.

At Puapua, the mullet fishing takes place between the reef and a ridge of unsubmerged rock running parallel with the reef at a place called Utuutu. A long net is stretched to form a deep *U* between the rock ridge and the reef with the open part facing to the east. The schools of fish come from that direction and when a sufficient number have entered the open enclosure, an-

other shorter net is run across the opening to close it. The scoop nets are then used on the outer side of the curve of the first net. Sometimes another school arrives before the first school is disposed of. These are kept waiting by shaking the short cross net. When the first school has been disposed of, the short net is drawn aside and the second school allowed to enter, when the short net is again drawn across. The schools which are kept waiting outside the short net are termed *tautau 'upenga*.

The mullet caught with the *tolo matu* and *alangamea* are red-lipped and hence called *'anae ngutu mumu* (*ngutu*, lip; *mumu*, red). This distinguishes them from the other mullet (*'anae Samoa*). The red-lipped mullet are stated by tradition to come from Fiji. The Samoan mullet is usually caught in an ordinary net, but the *alangamea* scoop is used for it at Nuuli (Tutuila), Palauli (Savaii), and also at Leulumoenga and Falelatai in Upolu.

The red-lipped mullet appears first in Upolu at Moataa. They are stated to come direct from Fiji to enter through a passage in the reef near Moataa in October. After passing along inside the reef, they move out through another passage near Vaiala and go on west to Savaii. At Savaii they enter through a channel called Tautu, which is opposite Iva. They proceed along inside the reef as far as Tuasivi, near which they pass out again. Further to the west, they re-enter the lagoon at Lano and go on to Puapua, where they are last seen. The season extends from October to December. The fishing is naturally best at Moataa, where up to 3,000 may be obtained at one catching. The shoals are further depleted at Iva before they reach Puapua, but Puapua, though last, is not least in tradition.

In Tutuila, the red-lipped mullet appear only at the western end. They appear first at Lauanae and then move westward to Amanave near the lighthouse island. Here they are caught in nets stretched across a channel between the small island and the coast. No *alangamea* scoop net is used.

TRADITIONAL ORIGIN

Sina and her daughter came from Fiji with a fish called *le i'a a Sina* (Sina's fish). They landed at Sangone in Savaii and travelled overland through the Saleleanga district, the fish following at sea. Sina, who was blind and led by her daughter, travelled through as far as Puapua without anyone offering hospitality on the way. At Puapua, she was entertained by Pau and Ungalo. In gratitude, Sina gave her fish to the village. To catch the fish, she told Pau and Ungalo to order the people to collect mats made of pandanus and coconut leaves. She indicated that the place within the reef, Utuutu, should be enclosed with mats between the ridge of rocks and the reef, leaving an opening towards the east. When the fish entered the enclosure, the open end was to be closed with more mats. The people were to surround the enclosure and catch the fish in other mats as they jumped over. This was carried out successfully. Sina ordered that the catch should be divided amongst the villagers, always after a share for herself had been set aside. The following prohibitions were made *sa*:

No coverings were to be used on the head except lime.

No coverings were to be used on the body except the ti leaf kilt (*titi*).

In this manner the body was to be exposed to the sun or the rain.

One day Sina's daughter came back from the beach saying the fishermen had returned home without leaving out a share for her. Weeping bitterly over this neglect and disrespect Sina set out to leave the village, her daughter leading her. The chief Le Malu, however, met her and finding that she was leaving the village, he begged her to forgive the discourtesy and remain. Sina remaining obdurate, Le Malu abased himself before her by throwing himself face downwards across her path (*pa'u fao*). He begged her first to rest in his house and then to take his daughter as food for her journey. Such respectful treatment had the effect of inducing Sina to stay.

Sina then gave the rule over her fish to Le Malu and delegated to Pau and Ungalo the task of watching for the coming of the schools of fish in the following words: "'Ia fa'ala ma fa'aua ia Pa'u ma Ungalo i le va'ava'aina o le i'a pe a sau, 'ae pule 'oe i le i'a" (May the sun scorch and the rain drench Pau and Ungalo whilst watching for the fish whether it will come but you Le Malu rule over the fish).

Subsequently, Le Malu, in consultation with Pau and Ungalo, decided that Toaloa should be *le mata-o-le-i'a* (the watcher for the fish).

To this day, a descendant of Toaloa holds the hereditary position of watcher for the fish. He stands to the east of the grounds and signals when the shoals are coming. The story goes on to say that the mats were changed to nets by the order of Sina.

Lack of agreement in tradition is seen in the Tutuila story.

Two youths of Tutuila went to Manua. On returning on their canoe a man on the coast of Tau called. They took no notice until they found they could make no progress. The canoe would not go forward. They took the man aboard, who was really the god Tangaloa. As they neared the islands of Tutuila, Upolu, and Savaii, Tangaloa hid the land so that they travelled on to Fiji.

From this he was called Tangaloa-ufi-nu'u (The concealer of land). At Fiji, the tale records their success in evading the pointing finger of the King of Fiji, which killed all against whom it was directed. Tangaloa sent the boys back with the *'aulosoloso* (flower stem of the coconut), the breadfruit (*manavenave*), and the *'anae* (mullet). He told them not to bail out their canoe. Opposite Puapua in Savaii, the canoe was heavy with water. They disregarded the command and in bailing out the canoe the mullet was cast out at Puapua. The boys were brothers of Tuiafono.

The use of the *alangamea* scoop net at Nuuuli for the Samoan mullet is an importation from Upolu and Savaii. Originally a framework, like a bench with a high back, was made of poles, and from a resemblance to a canoe (*va'a*) was termed *va'a tapa'au*. This was covered with coconut leaf mats (*tapa'au*). A number of them placed outside the *tolo matu* set net. People then chased the mullet from the inside. When they jumped over the net, they struck the high back and fell down on the bench part where they were secured.

Besides mullet the long net was also used to enclose the *matu*. It received its name *tolo matu* from this use. The term *tolo* is to curve around a net and set it by pushing it forward with the feet as in the use of the *lauloa*. The net thus encircled the *matu* and the enclosure gradually decreased in size. The *se'i* hand net was used for picking the fish up and it formed part of the equipment with the *tolo matu* net.

Shark nets (*'upenga malie.*) Shark nets as described in Tau were made of the thick three-ply twisted cord of *matiata* bast. The mesh was large; the

length about 50 yards, and the depth 18 feet. Floats made of breadfruit wood were attached to the upper rope at about 2 feet apart. Large stone sinkers were attached at either end and a lighter one in the middle. Two such stones are shown in Plate XL, *D*: one with a well marked longitudinal groove on either side was secured by Mr. Judd at Leone and was held to be an anchor for a special bait used in connection with the net. It could serve both purposes.

The bait consisted of two kinds: the *maunu seu* tied to the top line, and the *maunu tau,* tied to the meshes at different parts. The bait of fish attracted shark and other large fish which, in trying to secure the bait, got caught by the gills in the meshes.

The net is set outside the reef and at right angles to it. It had to be set in water that was not too deep. The stone sinkers or anchors (*taula*) had to rest on the ground. Hence the saying, applied to a dreamer who makes impractical suggestions with no sense in them: Lafo le taula i fonua (Drop the anchor where it will reach the ground).

With the first anchor near the reef, and the bottom line resting on the bottom, the floats are dragged under but still serve to keep the net upright. The upper line at each end has a large float, which reaches the surface and indicates the position of the net. The net is set in the afternoon and left until morning as the fish are caught by the gills at night. When the net is set, it is termed *fa'atofa le 'upenga* (putting the net to sleep for the night). The term is used only with a shark net.

In Asau, Savaii, a large net (*'upenga tanifa*) made of breadfruit was used for netting a kind of shark (*tanifa*) which came into the lagoon in large numbers at a certain season.

Breadfruit bast net. The net (*'upenga 'ulu*) is made of the bast preferably of the *aveloloa* breadfruit. The bark from shoots is scraped like the paper mulberry on a board but it is never beaten. When fresh, the bast is easily snapped but when dry and rolled (*milo*) into twisted cord, it is very strong.

The people at Safune had made a similar net but had given it as a present to the village of Leauvaa in Upolu. Fortunately, I tracked it down at Leauvaa and located it hanging up in a shed. The cord was of two-ply twist of the size of very thick string used in tying parcels. It varied considerably, however, in different parts of the net, some parts being comparatively thin. The mesh was 3 inches each way. The top rope was of five-ply sennit braid with a short length of three-ply added. The floats were the usual round sections of wood, some being 4.5 inches long by 4.5 inches in diameter; others were 3 inches in each measurement. The top rope was tied directly round them with the float knot in the usual way. The bottom line had no sinkers but was fixed to the bottom by rolling coral boulders or rocks over the line to rest on the net. The depth was 10 feet but the length which was considerable could not be ascertained. The net had a purse (*muli*).

This particular net was said to be made from the *'ulu manu'a* variety of breadfruit. It was called an *'upenga 'ulu* from the material but the same type was called *'upenga tanifa* in Asau from its function. Though the *tanifa* (a shark with three dorsal fins and a long thin tail like a *malauli,* caught within the reef in the passage, and close to the village at full tide in season) name is given, all fish that enter are grist to the mill.

Turtle net (*'upenga 'afa*). The turtle net gets its name of *'afa* from the three-ply sennit braid with which it is made. The braid is slightly thicker than the ordinary braid used in lashing houses.

The only net in Savaii was seen at Ngataivai. The mesh was 13 by 12 inches and tied with the usual netting knot. An idea of the size of the meshes may be obtained from Plate XLV, *C*. The top line was of three-ply braid of the same thickness as the net material. The floats were the usual round sections of wood, but in tying them with the top line the marginal mesh was caught in with the tie.

The float line was threaded through the marginal meshes before each float was tied on. The bottom line consisted of a well made five-ply sennit braid threaded through the marginal meshes. Stone sinkers were tied on the bottom line by a separate cord.

The net was 24 meshes deep and each mesh was a foot deep. Made in two parts, each about 34 fathoms long, the nets were wound separately on stout poles which served the purpose also of carrying poles hoisted on the shoulders of two men. The village of Ngataivai is in two parts, one on either side of the Ngataivai stream. As the full net was owned by the community, one portion was kept on either side of the river. When the head fisherman decided the time was favorable for turtle, the two sections were assembled and the village took part in the fishing.

The turtle net is used on the rockbound cliff-girt coast west of Ngataivai where there is no reef. The net is carried on canoes with the netting party while lookouts travel along the top of the cliffs looking for turtle. On seeing them, the lookouts signal the canoes and indicate where they are. The net is dropped in a line parallel with the shore opposite the point indicated. The men then jump overboard and form lines from the ends of the net to the shore. They beat the surface of the water with sticks (*lauta*). The shore ends of the lines then work inwards to join and then advance towards the net driving the turtle into it. The turtle get their heads through the meshes and are caught up in the net. In removing turtle, the front fins are held and the turtle guided in the required direction. In the daytime, the turtle are seen and readily removed. In netting at night, larger turtle are caught. Owing to the darkness, however, the net and turtle are bundled up together and taken ashore.

ANGLING

COBWEBS AND GORGES

Methods of obtaining individual fish by the mouth consist of the use of cobwebs, gorges and hooks.

Cobwebs are collected on a forked stick. A length of four to six inches is loosely rolled and tied to a short line on a bamboo rod. The fish caught are a small garfish (*ise*). The rod is flicked about and the *ise* in biting at the cobwebs trailing along the surface has its teeth entangled sufficiently to allow of its being lifted out of the water. Sometimes it is difficult to disentangle the fish.

A gorge is a support for a bait, which the fish swallows and is unable to eject. At Tau, it was stated that before metal hooks were used, a piece of wood sharpened at each end and tied at the middle to a line was in vogue. The stick and line were placed in the same straight line and a bait impaled to totally conceal the stick. The bait was swallowed and on pulling the line, the wood got caught crossways in the gullet of the fish. The only name thought of was *matau la'au* (wooden hook).

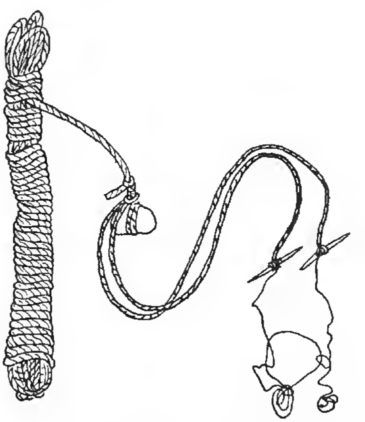


FIGURE 280.—Fish gorges in British Museum (from Beasley). Beasley (1, p. 23) say, "This contrivance consists of a bulky hank of twisted fibre line (*Pandanus?*), to which is attached a sinker of water-worn coral (*tufa*) about 2 inches (5.1 cm.) across. From this are two lines of fibre, each ending with sharply pointed wooden gorges 2.75 inches (7 cm.) in length, cut out of some pale wood, with very long bast strings attached."

A Savaiian expert said that an appliance was made of two pieces of wood, one long piece and a shorter piece tied loosely to it in such a way that when the line was pulled, the short piece crossed the other. He called it *fa'amailei ato*. The term *ato* here carries the meaning of a piece of wood sharpened at both ends while *fa'amailei* is to form like a trap.

Any doubt of the use of gorges is removed by the existence of actual

specimens duly attached to a line which exist in the British Museum. They were figured by Edge-Partington (10, vol. 2, p. 45) but his drawing gives the distinct impression that the gorges were attached to a float which in turn is attached to a line. Presumably the same gorges in the British Museum are later figured by Beasley (1, Pl. 37) and what looked like a float proves to be a sinker. (See figure 280.) Needless to say the line which Beasley (1, p. 23) queries as pandanus could not consist of that material as it was not used by the Samoans for cords or lines. It is a twisted line probably of *fau songa*. Gorges made of fish bone were also used as shown in the following description by Williams (43, p. 448) which was also quoted by Beasley.

> But the most ingenious method of fishing which I saw at the Samoas was the following: a number of hollow floats, about eight inches in diameter, and of the same height, were attached to a strong cord, at a short distance from each other. To each of these a line was fastened, about ten inches long, at the end of which was a fish bone, made very sharp at both ends, and suspended by the middle; so that when the fish seized the bait, the bone pierced it in contrary directions, and thus secured the prey. The floats answered two purposes; to attract the fish by their whiteness, and to show when it was caught.

HOOKS

The Samoan trolling hooks with shell shanks and turtle shell points mark the highest development in local fish hooks. They leave little to be desired as regards shaping and lashing. Between the gorges and the trolling hooks, however, there seems to have been an experimenting ground from which no successful experiment has spread widely enough to create an established type in common use. A straight point tied at an acute angle to a straight shank has been successfully used but has seemingly remained local. The tilting of fish bone gorges may have led to the idea of tying a fish bone point to a straight wooden shank at an angle. This technique was used in some parts.

BAITED HOOKS

Hook with wooden shank and fish bone point. A hook (*matau*) for catching the *mumu* fish is described in Samoan by Kramer (18, vol. 2, p. 194) from which the following is extracted:

> A fish bone was lashed to a coconut leaflet midrib (*tuaniu*). The bait used was the *unga* crab and the *fole* shell fish. The fishing took place from a canoe outside the reef (*tua'au*) and opposite the channels in it (*tuaava*). The crab was chewed (*mama*) and dropped overboard as ground bait. When the fish were attracted they took the hook.

A hook for catching *malauli* is localized to the village of Satupaitea in Savaii but no sample was obtained. I had travelled past that village when the hook was mentioned. A fish bone was tied to a straight piece of stick at an angle and used on the end of a sennit braid line attached to a bamboo rod. It was used to catch *malauli*. The manufacture was the sole right of one family of which Nuu is the present matai or head. Anyone desiring to use such a hook had to give Nuu a present and obtain his permission.

Though there are two definite accounts of this type of hook from different parts, the backward state of hook manufacture is illustrated by such a primitive type being patented and requiring a royalty to permit its use. Beasley (1, p. 24) quotes Bougainville as saying that the Samoans had "bad fish hooks, made of the bones of fish." Beasley thinking of the well made trolling hooks disagrees with the statement, but as Bougainville specifically mentions the bones of fish, he was evidently referring to the *mumu* or *malauli* type of hook, or to the fish bone gorges described by Williams.

Hook, with shank and point of wood. The eel hook (*matau tuna*) (Plate XLVII, *A*) is made from two pieces of the hard parts (*mata paongo*) of the tree fern (*olioli*) lashed together with *fau* bast. (See figure 281.)

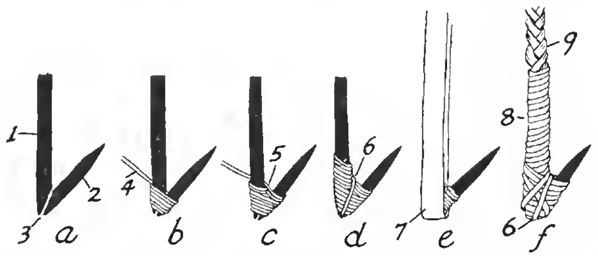


FIGURE 281.—Eel hook (*matau tuna*): *a,* A piece of hard wood about 2 inches long is rounded to a diameter of 0.15 inch to serve as the shank (1) and a shorter piece (2), 1 inch long, is similarly rounded and brought to a point at one end. The other end of the short piece and one end of the shank are then cut on a slant, each at an obtuse angle so that when fitted together, they form the acute angle desired (3). *b,* The two pieces are fitted together and bound with a thin strip of *fau* bast (4) that has been rolled into a single ply thread on the thigh. The commencing end of the thread is slanted upward on the shank and the turns commencing near the point of the junction are worked upwards towards the open angle. *c,* A few figure of eight turns (5) are then made around each element alternately. *d,* A longitudinal turn (6) is then taken from the open angle around the lower point, where the thread passes between the two wooden elements. This is the characteristic circumferential turn invariably used to prevent a lashing from slipping. A few turns are then taken around the shank and finished off with a half hitch. *e,* A strip of *fau* bast (7) wider than the shank is doubled around the lower end of the hook and brought upwards on each side of the shank; *f,* the lower end is again bound as before but over the added strip and the figure of eight turns around each wooden element and the longitudinal turn (6) over the lower point of junction are also made. The binding (8) is then continued up the shank alone so that the bast strip on either side come together and completely conceal the shank. At the upper end of the shank, the wrapping ceases and a half hitch is made through which the thread end passes twice to form the fixation knot. The two ends of the bast strip which is long are split up into narrower pieces, and divided into three equal lots, with one of which the end of the binding thread is incorporated. The three plies are plaited into a braid (9) for about 2 feet and finished with an overhand knot.

The bait consists of the large grub (*afato*) which are about 3 inches long and as thick as the finger. The head part is squeezed to push out the beak which is pinched off. The hook is pushed down into the grub through the opening made and the grub worked up until the hook is entirely covered. The

upper end of the grub is tied to the hook line by a couple of turns of sennit fibre.

The fisherman's equipment consisted of a small basket containing a dozen hooks, the grubs tied up in a piece of banana leaf and some coconut husk fibre. When we neared the edge of the lagoon, the hooks were all baited. To the end of the plaited bast carrying the hooks, ordinary strips of bast about 3 feet long had been tied.

The fishing ground was a marshy spot amongst tree roots and dead branches where the stream near Malaeloa, Tutuila, had flowed in over the flat ground to form a lagoon. The bottom was soft and muddy. In places one sank in up to the armpits in water. The fisherman and I waded through and when he saw a deep looking hole, he broke off a small branch of the *felana* or *lelepa* trees which grew thickly through the lagoon. The small branch with half a dozen leaves was tied to the end of the bast attached to the hook line. The baited hook was thrown into the water with the branch acting as a float (*fa'autouto*) to help in locating the hook next morning. As it may be towed a little way, it gives to the struggles of the fish, whereas, if tied to a tree the hook might break. The hooks were set in different places, the fisherman making a mental note of his line. As the last hook was set, he marked a tree with his bush knife to indicate the end of his line. The hooks were set in the evening and left overnight. In the early morning we picked up the hooks. Lauofo, the fisherman, could tell by the appearance of the branch floats whether an eel was caught or not. When the leaves were floating on the surface in the same position as when set, he said, "Leai se tuna" (There is no eel). He picked up his hooks as we went along. It was at the end of the line that he called, "Matamata, tuna" (Look, eel). The leaf float had been drawn to the side and the stalk instead of lying horizontal on the surface, was pulled down.

The process of making the hook (*matau*) is *fafau matau*. The shank part is the *to'o* and the short piece with the point, the *manga*.

On Tutuila, the *matau tuna* is used in the fresh-water lagoon at Malaeloa and in the fresh-water stream at Aoloau.

Dolphin hook. Fishing voyages out into deep water, where not specifically mentioned as *alofanga* or *alafanga* in which different unbaited spinners are used, were alluded to as *tiunga*. In *tiunga malie* (fishing for shark) the slip noose was used. The expression *tiunga masimasi* is contantly referred to even now as a form of fishing that was once indulged in. Pratt (23, p. 200) gives the *masimasi* as a dolphin and Demandt (9, p. 119) as a species of *Caranx*. The Hon. O. F. Nelson told me that fast sailing canoes, larger than bonito canoes, were used. Loose bait was thrown overboard during one sweep. The canoe after tacking came sweeping down over the same ground with baited trolling hooks out. He said that there are traditions of such canoes being lost

through venturing too far owing to fast sailing and not being able to beat back. The late Mr. Gosche of Savaii told me that he had seen such canoes trolling for dolphin without a rod. Kramer (18, vol. 2, p. 194) says that a canoe with five cross booms (*'iato lima*) was used in trolling (*toso*) a *pa* hook for *masimasi*. In Savaii, it was said that the hook was made of two pieces of wood tied together at an angle to form a large hook which was baited with a whole fish. Exact detail of the hook is lacking but it is evident that a large baited hook probably made of wood was trolled for *masimasi*.

Other wooden hooks. Demandt (9, p. 31) figures a one-piece wooden hook with a wide angle and a barbed point as *matau fa'ato'elau*. He describes a method of fishing from a canoe drifting before the southeast trade wind (*to'elau*) with a rod for smaller fish such as the *ngatala*, as the *fa'ato'elau* method of fishing. Here *to'elau* is from the trade wind name. He then goes on to explain the *matau fa'ato'elau* as referring to a facsimile of the iron barbed hook made of wire, a pin, or also cut wood, where the name means, "according to the example of Tokelau Island." He ends by saying it was not used in Samoa. Gudger (13, p. 276) in his study of *Ruvettus* hooks reproduces Demandt's hook and accepts it as Samoan. Demandt's description of a method and a hook not used in the method because they both had the name *to'elau* is certainly confusing but the type of hook figured belongs to the Tokelau Islands. Gudger's idea that it resembled a *Ruvettus* hook with unusual features may be correct as the *Ruvettus* was purposely caught in the Tokelau group. In Samoa, the fishing off the reef with trolling hooks that caught *Ruvettus* according to Demandt was for other fish and happened on the *Ruvettus* by accident.

Kramer (18, vol. 2, p. 170) figures another one-piece wooden hook with a good bend and a barbed point. It appears to be a large hook and Kramer states that it was used for catching large fish. Gudger (15, p. 299) draws attention to its similarity to the *Ruvettus* hooks from Nauru but it is more likely to be a *masimasi* hook, if it is an old time Samoan hook.

Beasley (1, p. 22) says that there is only one large wooden hook that he knows of and it is in the Dresden Museum. He gives no details but infers from its size that it is a shark hook. The outstanding feature of Samoan shark fishing is that a noose was in general use and the hook, as a consequence no doubt, never obtained a footing. Kramer (18, vol. 2, p. 198) in describing *tiunga malie* (shark fishing) after dealing with the noose method at length, quotes Pritchard in saying that a hook was used. Pritchard (24, p. 171) says that sharks came inside the reef. In the evening a hook was taken out in a small canoe and dropped overboard in two fathoms of water. When a shark took the bait it was hauled in from the shore until it got into shallow water where it floundered and exhausted itself. This is not a deep sea method but local to a particular district. It is probable that a metal hook was used.

Demandt (9, pp. 80, 84) whose work is the most exhaustive on fishing, after describing the deep-sea method of shark noosing, states that many fishers in the high seas take along a rather large trailing fish hook on which occasionally the sea pike bites. The Samoans now only speak of three methods of deep-sea fishing; the noose method for shark, the unbaited trolled hook with a shank of shell or bone for *tangi,* and the large wooden hook baited and trolled for *masimasi.* I would suggest that the Dresden hook is not for shark but for *masimasi.*

The very lack of hook material in museums is due probably to the poor development of baited hooks and their crude form not appealing to collectors when they were in actual use. The opportunity is now lost as the trade hooks have superceded the baited hooks but have made little difference to the unbaited hooks, which still survive. The active use of the gorge may be taken as an indication that invention in the direction of bait bearing appliances had not reached a stage of satisfactory progress in Samoa.

TROLLING HOOKS

The hooks dealt with come under the general name of *matau,* while *pa* denotes the specialized form which are trolled as "spinners." The *pa* is a true lure made to represent a small fish. It is drawn through the water without bait. The movement deceives fish into seizing it when they are caught by the point of the hook.

Classes. Samoans divide their *pa* hooks into four classes; *pa tangi, pa'atu, pa ala,* and *pa seuseu.* Each class is distinct in details of manufacture, method of use, and the fish angled for. Field work can supplement the museum study made by Beasley (1, pp. 22-25) and clear up some of the confusion the lack of native information caused him. The usual Samoan custom of using hook names to distinguish the fish caught, the color or kind of shell used, the size of the hook, and the method of fishing used is also conducive to confusion as to the actual number of types of hook used. The usual names are here tabulated with the class name in heavy type.

Class	Fish	Shell color	Kind of shell	Size	Method of use
I.	**Pa tangi**	....	....	....	....
II.	**Pa'atu**	Pa usi Pa laumilo Pa ulia Pa sulu Pa lautofe	Pa tio	Pa maunu Pa no'ono	....
III.	....	Pa ulutoto Pa lavelei Pa laveuli Pa ululalafi Pa ala sina	Pa foafoa	....	**Pa ala**
IV.	....	....	....	....	**Pa seuseu** Pa aloalo

Parts of the hook. Hooks are regionally divided into the shank, bend and point. The point may be provided with a barb. Samoan trolling hooks are composite and consist of two pieces. One piece forms the shank, which is shaped to represent a fish and is termed the *pa*. Thus, the shank which is the characteristic feature of the hook as against the general *matau* came to represent the type. The other piece forms both the bend and the point and is called the *manga* (branch or fork). Churchill quoted by Beasley (1, p. 22) was in error in stating that *maga* (*manga*) is the pearl shell shank.

The second piece, though it forms the bend and the base lashed to the shank as well as the point, will hereafter be referred to as the point in preference to barb as used by Beasley. The barb is a special oblique projection backwards from the actual point made for the specific purpose of preventing the point from slipping out and becoming thus freed by the struggles of the fish after it has been pierced by the point. It is a distinct invention of some cultural importance and is not present in the Samoan trolling hooks so far examined. Their feature is that the points are without barbs.

The snood is the piece of cord or line attached directly to the hook which together with the lashing forms an essential part of the completed hook.

The hackle consists of something added in the form of fibre, feathers, or hair to represent the tail or fins of a fish and so adds to the efficiency of the lure.

Manufacture of hooks. The making of hooks was expert work and a master fisherman (*tautai*) was not always a good hook maker. A certain amount of ceremonial is observed in making bonito hooks. The craftsman works indoors seated on a raised pile of mats. When employed by a chief, the chief has to make a special oven of food and send him a basket of cooked food of good quality.

The materials required were shell for the shanks, turtle shell for the points, cord for the snood, fine threads for the lashings and feathers, and strips of *fau songa* for the hackle.

The tools were the drill (*vili*), rubbing stone (*foanga*), and cutting implements. In these days, a saw is used for cutting the shell and a foreign grindstone for rubbing down. In ancient times, stone flakes must have been used for cutting the shell. The Samoan type of drill (fig. 282) is still in common use but the point is steel instead of stone. The disc which acts as a balance is termed *tateme, livaliva,* or *vinavina*.

The drill is used by twirling the upright so as to wind up the cords supporting the handle. The winding raises the handle. The point of the drill is placed on the object. When downward pressure is exerted on the handle, the cords in unwinding cause the upright to revolve. Sufficient pressure is used to cause the upright to go on revolving after the cords are fully unwound,

and thus wind them up again in the opposite direction. The craftsman keeps his fingers over the handle and when it rises to the requisite height, he presses again. Practice enables the right amount of pressure to be judged. The upright thus revolves backwards and forwards alternately with each application of pressure to the handle. Some of the handles now consist of a wider piece of wood with a hole through the middle which is slipped down over the upright. The hole is large enough to allow it to work easily up and down on the upright. The detached handle is worked almost as easily for the

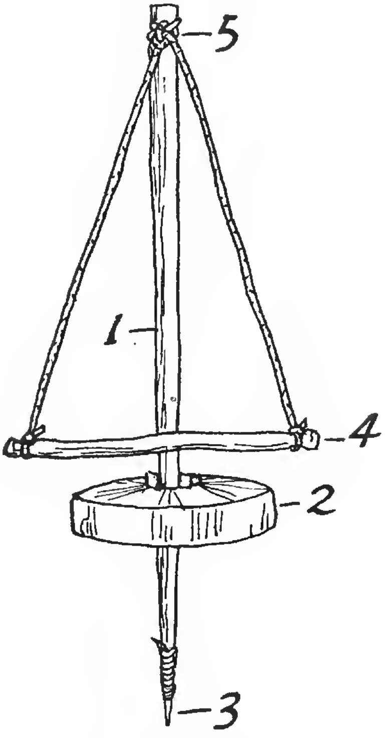


FIGURE 282.—Drill (*auvili*). The drill of average size consists of an upright stick about 17 inches long and barely 0.5 inch in diameter. The stick (1) also receives the name of *vili*. A wooden disc (2) about 4 inches in diameter, perforated with a central hole, is run up on the stick to about 6 inches from its lower end and kept in position if necessary with wooden wedges. The lower end of the upright supports the boring point (3) which may consist of a stone flake and in some cases of a spine of the *vana* (*Echinus*). The point is thus called *mata* (point) or *matavana* or simply *vana* from the *Echinus* spine. The point is lashed to the upright with fine cord. The handle (*'au*) consists of a crossbar (4) of about the same thickness as the upright and about 7 inches long. A piece of sennit braid or twisted cord is tied by its middle round the upper end of the upright with a clove hitch (5). The two ends are then tied to the ends of the crossbar handle so that when the handle hangs down it is about an inch above the balance disc.

forefinger and middle finger extend across the handle on either side of the upright and slide up and down in this position to keep it straight.

The movement of the drill has been made the subject of many sayings. In them the credit is given to the point. The revolving balance is somewhat unjustly regarded as making a lot of movement or dancing (*siva*) and doing no work. "Ua tu le matavana i le fingota 'ae siva le livaliva" (The point formed by the echinus stands up [to work] the balance dances).

Pratt (23, p. 128) gives the following: "Ua se temeteme" (Like the stick of a drill): "Applied to a restless, useless man who talks a great deal, but does nothing useful." The term *temeteme* is a variant of *tateme*.

THE LARGE TROLLING HOOK

The *tangi* is a deep sea fish larger than the bonito. The hook as verbally described was said to be larger than a bonito hook. It was a composite hook made in two pieces and the point was lashed to the shank in exactly the same way as in the bonito hook. No complete *pa tangi* was seen and it is not figured by Beasley, Demandt, or Kramer. Mr. Judd (17, p. 61) secured a large shank (Pl. XLVII, *B*, 11) at Leone which the owner said was a *pa tangi*. The shank, made of *lei* (whale ivory) is long, with its widest part near the head pointed end, and narrows to the end which bears the point. The front has a flat surface for the attachment of the point, while towards the head, the two rounded sides meet in a median ridge which extends to a point. A transverse hole is bored through under the median ridge in the head part. The back, convex longitudinally and slightly so transversely, is covered with colored pearl shell, neatly fitted and lashed through two paired holes which meet in the body of the shank to allow the lashing to pass through. The paired holes are towards either end of the pearl shell plate. No point was obtained with the shank, but the owner stated that one made of *niuvao* hard wood had been attached when used by his grandfather.

Tongan hooks with identical shanks and barbed turtle shell points are well established. They are figured by Beasley (1, Pl. XXXVI) and a specimen in Bishop Museum is figured in Plate XLVII, *B*, 12.

The fact that the type of shank is not elsewhere recorded from Samoa throws serious doubts on the shank being native Samoan. Confirmation is required before it can be accepted as representing the *pa tangi* of Samoa. On the other hand I have no definite information as to what the Samoan *pa tangi* was like except that it was a trolling hook of larger size than the bonito hook.

BONITO TROLLING HOOK

The *pa'atu* (*pa*, hook; *'atu*, bonito) is a composite two-piece hook with a shell shank and a turtle shell point. (See Plate XLVII, *B*, 2-5). It is still in

common use and is made and lashed with the old technique except for the implements used.

Shell. All shanks are now made of pearl shell, as the shell is readily obtained from other parts and even stocked for sale by traders. Occasionally, in a remote village, a person not having pearl shell may fall back on other shell or even wood. As pearl shell does not belong to Samoan waters recourse was had in former times to other material. A *tofe* bivalve (*Perna*) and a silicaceous rod-like material (*tio*) formed in the borings of certain sea worms in coral rock were used and probably other shells as well.

The shell is selected in various shades of color to suit different conditions of water and weather. The *pa tio* forms a very white hook suitable in cloudy weather. So also is the *pa usi*. The *pa laumilo* is yellowish-brown (*memea*) and the *pa ulia* has a dark part towards the distal end. The *pa lautofe* (*Perna*) is shiny and iridescent. In Manua, the name *pa sulu* was given to a brownish color (*enaena*). Demandt (9, p. 77) also records the names *pa lanulua* and *pa lupovai* as other varieties of shade and material. The craftsmen were expert at producing shades of color by varying the amount of the dark outer surface removed in grinding.

As regards size, the large hooks were named *pa no'ono*. The smallest size was termed *pa maunu* as it was said to act as bait (*maunu*) to attract fish.

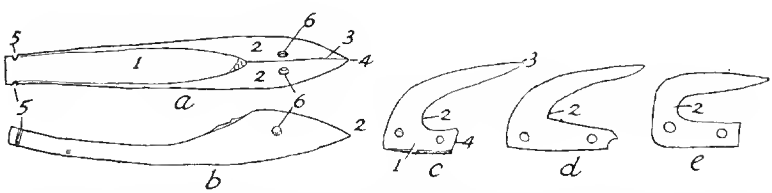


Figure 283.—Bonito hook shanks and points: *a*, front view; length, 103 mm.; greatest width, 15 mm.; tail width, 8 mm.; the inner surface (1) of the shell forms the front part and carries the point at the tail end. The front of the head end is ground at an equal slant inwards from the sides (2) to meet in a median longitudinal edge (3) making the head triangular in cross section. The two sides and back narrow to a point (4). The sides are grooved (5) near the tail end to take the end lashing (*fausanga i'u*). *b*, Side view; maximum thickness of head, 15 mm.; thickness of tail end, 5 mm.; hole (6) drilled transversely through head 20 mm. from the point (4) and about 4 mm. below the median edge. The raised part of the head with the median edge is called *isu* (nose) in Tutuila. The sides of the tail end are vertical or slightly convex. The back is convex longitudinally following the outer curve of the shell but owing to the narrow width is flat transversely. The tail portion is concave longitudinally in front. *c*, The point; straight base, 20 mm. long; two holes for lashing; slant edge on right; depth of base part, 6 mm.; point diverges out being 26 mm. from front of shank. The point element carries the base (1), the bend (2) and the actual point (3). *d*, Point portion; straight base, 30 mm. long; curved right edge to base; depth above right hole, 7 mm.; sharp angle at bend (2); point diverges out being 26 mm., from front of shank; *e*, point portion; base 26 mm. long but curved on left; depth of base, 7 mm., with vertical right edge; point parallel with base line and 20 mm., from front of shank.

Shank and point. The pearl shell was cut across the thick hinge part to include it for the head (*ulu*) while the thinner inner part of the shell formed the tail (*i'u*). Head and tail are the terms applied by the Samoans to the proximal and distal ends, and as the shank is made to represent a decoy fish, the terms are useful descriptively. Sizes vary but a fair range in length is between 65 and 105 mm. (See figure 283.)

The point is made of turtle shell (*una laumei*) although some are made of pearl shell, generally of the darker part towards the edge of the shell (See Plate XLVII, *B*, 4.) It is, however, not usual and the points so made have probably been due to lack of turtle shell and not to election. The points are devoid of barbs and are shaped as in figure 283, *c*, *d*, and *e*.

The hackle is composed of strips of *fau songa* fibre.

The lashing of the two parts together is termed *fausanga*. Considerable variation exists in the number of times the binding thread passes through the various holes, the circumferential turns round them, the twists round the cord, and the fixation by half hitches and stop knots. Each combination forms a *fausanga* which is no haphazard arrangement but one with a definite count. Different experts have their own combinations. Some *fausanga* which are supposed to be better and luckier than others are kept secret by their exponents. Hooks with the attached snood were sometimes stolen by fishermen in order to study the lucky combination and commit it to memory.

In dealing with the shank, the tail end which carries the point is termed *lalo* (below) and the head end with the snood is *lunga* (above.) *Lalo* and *lunga* as meaning below and above are also applied to relationship with the snood (*ta'a*) when the point is in the horizontal position. The *fausanga* besides including the whole process of lashing also refers particularly to three local lashings that pass through the two holes of the point and the hole through the head of the shank. The first step is to lash the *manga* point to the distal end of the *pa* shank and the second to attach the *ta'a* snood. The lashing to be described was written down by Le Oso Ripley, senior talking chief of Leone in 1920, for his son Fepuleai, who demonstrated each stage from his father's manuscript. To give an idea of the formula and the details that had to be remembered, it is given in full with the technique of the first stage of lashing in figure 284, showing the various parts named.

The point (*manga*) has been firmly fixed to the shank (*pa*) by three lashings through the inner hole (*fausanga loto*) and the lower tail hole (*fausanga i'u*) while four running loops have been placed in position for the attachment of the hackle (*senga*). The next stage consists of attaching the snood (*ta'a*) to the point. (See figure 285.)

The preliminaries of attaching the snood and lashing cord (*alaala loloa*) to the inner hole of the point having been done, the hook is fixed in an

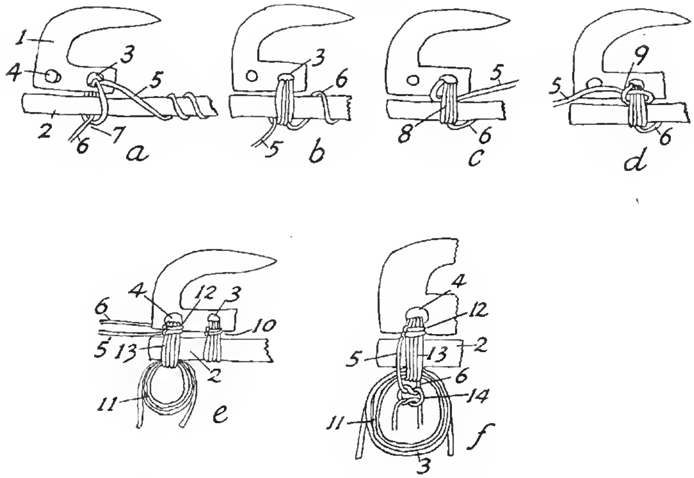


FIGURE 284.—Bonito hook, lashing formula and technique of lashing point to shank. Lashing formula: 2 *fausanga loto*, 2 *langolango i tutui i lunga*, 2 *fausanga i'u*, 2 *langolango i tutui i lunga*, 2 *noatanga o le fausanga i'u*, 1 *lona fa'apona*, 4 *o le senga*, 2 *alaala loloa i lalo o le ta'a*, 6 *le alaalaloloa*, 2 *lave noa*, 4 *fausanga o le isu*, 5 *fausanga i lunga o le ta'a*, 4 *fa'amaunga*, 4 *senga sele manu pito alaala lua*, 2 *noatanga o le senga*, 2 *ona fa'apona*. The numbers refer to the number of turns taken with each step mentioned.

Lashing of inner hole (*fausanga loto*): *a*, The point (1) is placed in position on the front of the lower end of the shank (2) and lashing commences with the inner hole (3). A length of thread is passed through the hole to its middle. Each half of the thread is dealt with separately so the near half (5) is wound spirally around the shank to keep it out of the way. The formula says "2 *fausanga loto*" which means 2 complete turns through the inner hole with each half thread. The far thread (6) is brought around under the shank, through the hole from the near side and through the first turn under the shank. The thread is drawn taut with the crossing (7) kept in the middle line under the shank. *b*, A second similar turn is made and the thread (6) wound around the shank out of the way after the thread (5) has been loosed. The thread (5) makes two similar turns which really amount to 4 half hitches. *c*, The formula demands two *langolango* turns, which consist of half hitches made round the previous turns of the lashing and corresponds in principle to the circumferential turns (*langolango*) used in house and other lashings. The thread (5) which ended at the half hitch below (*b*), continues its course upwards and passes through the hole from the far side to make the two *langolango* half hitches round the near lashing (8). The question of which side to enter under is decided in the formula by the words *tutui i lunga* (thread towards the upper end). The thread (5) therefore passes under the lashing (8) from the lower end. *d*, The thread (5) completes the half hitch (9) by passing back over the lashing and through its own loop on the lower side of the lashing. The hitch is drawn taut. *e*, The thread (5) completes the second half hitch and the other thread (6) after passing through the hole from the near side, makes two half hitches around the lashing on the far side of the hole. The ends of the two threads are disposed of by making single overhand knots as close to the lashing as possible and then cutting them off. The knots act as stopper knots to prevent the ends slipping through the half hitches. The *langolango* hitches (10) complete the full technique of the *fausanga loto*.

The tail lashing (*fausanga i'u*) is made through the outer or tail hole (4) but differs from the previous lashing in having to provide for the *senga* hackle. The hackle is provided for in the formula "4 *senga sele manu pito alaala lua*" (4 slip loop [*sele manu*] with

a long thread [*alaala*] with 2 ends [*pito lua*]). A long length of thread (11) is therefore formed into 4 ordinary loops in the middle part to allow of the two ends being free. The loops (11) are placed longitudinally against the under surface of the shank (2) below the hole (4), and held while another thread is passed through the hole to its middle. The formula says "2 *fausanga i'u*" so two half hitch turns are made with each half of the thread in exactly the same way as in the preceding lashing, but in passing around the shank, the turns pass through the open loop of the *senga* tail (11) and lash them securely to the shank. The *langolango* half hitches (12) are made around the lashing (13) from below upwards as in (*c*) and the ends of the threads (5, 6) left long, *f*, Instead of finishing the threads with overhand knots (*pona*), the formula says "2 *noatanga o le fausanga i'u*" (2 knots of the tail lashing). The term *noatanga* means the single turn of a reef knot and 2 *notanga* thus means a complete reef knot. The 2 threads (5, 6) are therefore brought down and tied in a reef knot under the shank. The reef knot (14) is shown loose in the figure to illustrate the technique but when drawn taut against the shank, the tie further assists in fixing the *senga* loop to the shank. The formula states "1 *lona fa'apona*" (their single overhand knot). The threads are therefore finished off with single overhand knots to prevent the ends slipping through the reef knot made. The formula merely states "4 *o le senga*" (4 of the *senga* tail) so the 4 loops of the *senga* already in position (11) are left for subsequent treatment.

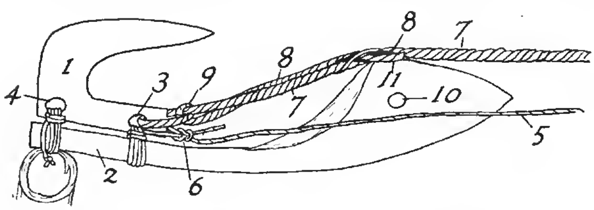


FIGURE 285.—Bonito hook lashing, tying the snood (*ta'a*) and the lashing thread (*alaala loloa*). The lashing thread (5), about 6 feet long, is drawn through the inner hole (3) to within 6 inches of its end and tied with a reef knot (6). The snood (7), made of three-ply twisted *fau songa*, is also passed through the inner hole (3) and tied in the first part (9) of a reef knot (1 *noatanga*), leaving a short free end (8) that reaches to above the hole (10) through the head of the shank. The short piece of the snood is stretched beside the long part and fixed by pushing its end (11) through under one of the plies of the main snood (7) by raising the ply with a pointed stick.

ingenious manner between the knees to give the craftsman easy control while he completes the lashing. (See figure 286.)

With the hook stretched taut between his knees, the craftsman has both hands free to complete the lashing of the snood to the head of the shank as in figure 287.

The lashing is quite simple when worked to a formula. The number of turns and knots, and whether the *langolango* lashings came from below or above, can be varied to form different formulas. The one given was the favorite technique of a master fisherman. Some lashings instead of tying the ends of the threads of the *fausanga i'u* beneath the loops for the hackle tie them over the end of the hook between the shank and the point.

A bonito hook made entirely of coconut wood was seen by Mr. Judd (17, p. 61) on Tau. When turtle shell was not available for points, shell, bone, and even wood (*olioli*) were used as a substitute.

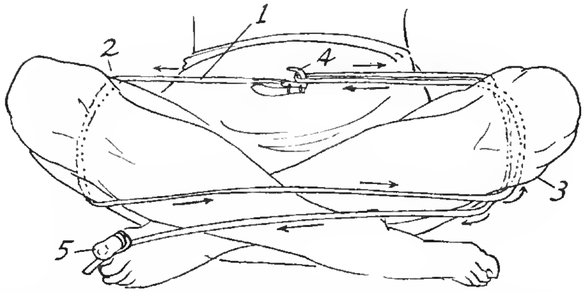


FIGURE 286.—Bonito hook in position for lashing the snood and head. The craftsman sits cross legged on the floor. If the snood is short, a long cord (1) is tied to its end. With the point of the hook to the craftsman's left, the long cord (1) is passed over the right thigh (2), brought back under the knee to pass across under to the left knee (3), and over the left thigh to the middle line where it is hooked around the curved point of the hook (4). The cord is returned over the left thigh under the left knee and across to the right big toe (5) around which it is twisted.

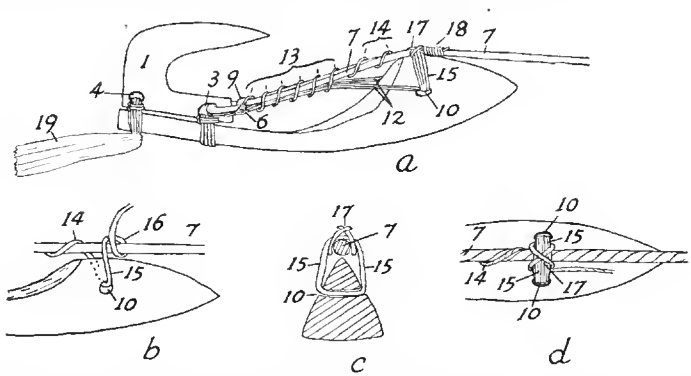


FIGURE 287.—Bonito hook, lashing completed by lashing snood to head: *a*, the figure continues on with the numbering from fig. 285. The formula (fig. 284) states "2 *alaala loloa i lalo o le ta'a*" (2 turns of the lashing thread below the snood). The lashing thread from its attachment (6) to the point is passed through the head hole (10) and back through the inner hole (3) of the point for the required two turns (12) below the snood. The turns are drawn taut. The formula then directs that 6 turns of the lashing thread be taken around the snood. The 6 turns (13) are made with a wide spiral and by passing around both limbs of the snood and the lashing thread turns (12) through the head hole, the elements are lashed together and tightened up. The formula directs 2 ordinary turns (2 *lave noa*) which are made around the two limbs of the snood alone (14). This brings the lashing thread above the head hole (10) and the *fausanga o le isu* (lashing of the nose) is proceeded with. In Tutuila, the median raised ridge above the hole is termed *isu* (nose) but in Manua the lashing is termed *fausanga ulu* (head lashing). The nose lashing (15) is shown completed, with figure of eight turns (17) above it. *b*, The detail of the turns through the head hole (10) is shown. The lashing thread after its last turn (14) around the snood, passes through the hole from the far side and passing upwards on the near side makes a complete turn (16) around the snood (7). It passes down through the hole and in all, four turns (4 *fausanga o le isu*) are made through the hole with a full turn (16) around the snood in every case. *c*, Section through hole. The formula asks for 5 turns above the snood (5 *fausanga i lunga o le ta'a*). The turns are made diagonally passing through under the lashing (15) on either side of the snood (7)

and crossing in the middle line above it (17). *d,* View from above. The first crossing (17) above the snood is shown. Five turns are made so arranged as to form the simple lozenge motive. Continuing with *a* after the last figure of eight turn over the lashing, the lashing is fixed (*fa'amaunga*) with a series of half hitches (18) around the snood and the end cut off. The formula asks for 4 *fa'a maunga* but more are shown in the figure. The thread is cut off and the actual lashing is completed as shown. The hackle (19) consisting of a small bundle of strips of *fau songa,* is passed transversely to their middle, through the 4 open loops under the lower end of the shank (fig. 284, *e,* 11). The four loops are drawn taut in turn to firmly attach the hackle to the shank. The two ends of the thread are tied in a reef knot (2 *noatanga o le senga*) and each thread finished off with 2 overhand knots (2 *ona fa'apona*). The two ends of the hackle are drawn together and cut off level (19). A fair length of hackle is 42 mm.

Rods. The hook was trolled from a length of line tied to a rod. Rods are of two kinds; the long and the short.

The long rod (*launiu*) of bamboo (*'ofe*) is about 15 feet 6 inches long, 2 inches in diameter at the thick end and tapering off to 0.75 inches at the other end. The thick end is fitted into a wooden handle. The wooden handle (*tu'au*) has an upper grooved part for the rod and ends below in a knob

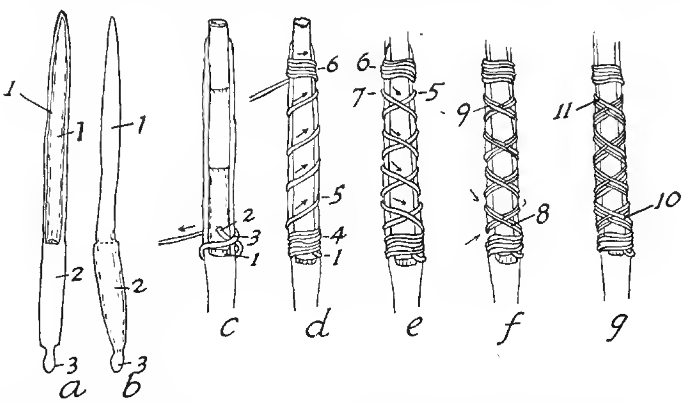


FIGURE 288.—Lashing bamboo rod to wooden handle: *a,* wooden handle, upper view; handle length, 42 inches; upper grooved part (1), 27 inches long; proximal stock part (2) gradually narrowed, ends in rounded knob (3) about 2.75 inches long usually with constricted neck. *b,* Side view of handle showing curve of stock, triangular in cross section with flat upper surface and sides curved to meet in median longitudinal edge at the back. Stock near groove, 2.7 inches thick; sides as well as upper surface narrow off towards the terminal knob. *c,* The bamboo butt end (1) is fitted into the groove of the handle and the two lashed together with sennit braid. The end (2) of the braid is placed over the butt end of the bamboo with an upward slant. A transverse turn (3) is taken around both elements and crossed over the short end to fix it. *d,* A number of close transverse turns (4) are made and the braid end covered by them. The braid is then carried in spiral turns (5) to the upper end of the handle where a few transverse turns (6) are made. *e,* The braid is then carried back with spiral turns (7) which cross the previous turns on the bamboo rod in the middle line. *f,* To make the lashing extra secure, a second set of spiral turns both up (8) and down (9) may be applied close to the first set on the same side of the first set. *g,* In some elaborately lashed rods, a third set of spirals is applied. The third set ascends (10) and descends (11) on the other side of the first set.

(*umele*). The shape of the handle and the method of lashing the rod is described in figure 288.

A short rod (*matila*) is made in exactly the same way but with a shorter length of bamboo and a slightly smaller wooden handle. A *matila* examined had a bamboo rod 8 feet long and the *tu'au* handle was 39 inches long.

The lashing may differ in having transverse instead of crossing oblique turns. After fitting the rod to the handle, the lashing commenced around the top end of the handle. (See figure 289.)

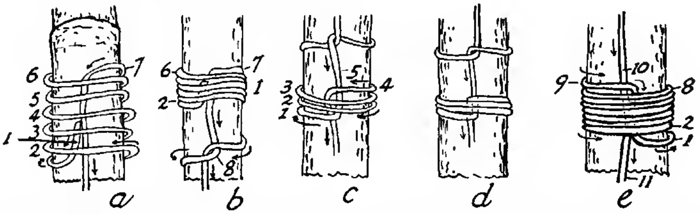


FIGURE 289.—Bamboo rod lashing (different type): *a,* the braid end (1) was placed obliquely upwards on the back of the handle and held in position with the left thumb. The working hank is passed to the left and around the rod from left to right in a transverse turn. Emerging on the right it makes the loose turn 2 over the thumb. Four more complete turns (3-6) are made loosely over the thumb which continues throughout to hold the braid end in position. After the fifth turn (6) the hank after passing around the rod and appearing on the right (7) is passed downwards under the loose transverse turns. *b,* The right hand now seizes the first loose turn (2) and draws it taut by pulling to the left, the left thumb being removed from under the loose turns in such a manner as to hold the part below the turn until the turn has passed over it. The left thumb is then placed over the crossing of the first turn (2) over the braid end and holds it in position against the rod. Each of the other turns is drawn taut in turn, the left thumb passing on to each turn as it is tightened. Each turn is drawn close to the preceding one. When the last turn (6) is drawn taut, the part turn (7) is drawn taut as far as the middle line and held by the left thumb while the right hand pulls the coil downwards and removes the slack. A single transverse turn may be made at intervals as in 8. *c,* Here and there a lashing of two or three turns is made by making two or three loose turns over the thumb commencing from below upwards (1-3). The last part turn (4) crosses to the middle line over the original descending braid (5) and the hank is passed down under the loose turns. *d,* The turns are drawn taut in the same way from below upwards and the hank pulled downwards to remove the slack. *e,* The braid has descended throughout in the middle line on the back of the handle and all the half hitch crossings are made in the middle line. When the braid reaches the lower level of the rod butt, the hank is carried to the right (1) and brought around from right to left, appearing on the left side of the rod. Seven loose turns (2-8) are now made over the left thumb in the same direction which is the reverse of the previous lashings. The turns are made in order from below upwards. After the last complete turn (8) the braid is brought around to the left at the back and appearing on the left side (9) crosses over the descending braid (10) in the middle line, and is passed downwards under the loose turns (11). Holding the bend of the commencing turn (1) near the middle line with the left thumb, each turn is drawn taut in turn from below upwards. After the last part turn (9) is drawn taut to the middle line, the hank is pulled downwards to remove the slack and the braid cut off close to the first turn (2). The first two turns (1, 2) on the other side of the handle pass behind the butt of the bamboo and the others over it. Before tightening the last lashing, the hook rest end was drawn up under the loose coils and lashed down to the handle as the coils were tightened.

The hook rest (*silinga*). About 6.5 inches from the inner end of the groove, a transverse hole is bored through the stock close to the inferior median edge. Through the hole, a twisted cord is drawn to its middle and then the two ends are twisted over each other in the first movement of tying a reef knot to form a series of continuous loops each about an inch long. The loops are continued outward until they reach the commencement of the grooved part of the handle. The loops are really made before the lashing of the handle commences. The ends of the two cords are held against the under surface of the stock, and the transverse lashings round the butt end of the bamboo rod and the handle are also carried over the *silinga* cords so as to fix them. The hooks are hooked into the loops when the line is not being trolled.

Another type of *silinga* is formed by stretching one end of the cord taut after it has been passed through the hole. The loops are formed by making open half hitches round the taut cord with the other one. The ends are fixed in the same way.

Attachments. The end of the hook snood is tied to a piece of line which must be longer than the rod. Some were simply tied by placing the two ends together and tying a single overhand knot with the double cord. Another method is to tie an overhand knot around the line with the end of the snood. The end of the line is then tied in an overhand knot around the snood and the two knots drawn together.

The hook is first stuck through a loop in the hook rest and the line drawn taut to the outer end of the rod. At about two inches from the end, the line is tied around the rod with a clove hitch. It is usual to attach two or more hooks, each with its own length of line, to the rod. Another hook is stuck in another loop of the hook rest, the line drawn taut and tied with a clove hitch to the outer side of the first. Two other hooks may be treated similarly, the hooks being hooked into different loops and the taut line tied with a clove hitch just beyond the preceding one. The four slack ends of line are then brought down the rod together and fastened at short intervals with half hitches round the rod. When they come to the end, one which is purposely left longer than the others is tied in a half hitch over all four and fixed to itself with an overhand knot.

The number of hooks attached to a rod may range from one to eight as the fisherman desires. Different kinds of hooks as regards color and shade were attached and all being hooked to the hook rest were out of the way and the lines were all taut along the length of the rod. On the fishing ground, the fisherman unhitched the one he thought suited to the conditions prevailing. If he wished to change, he merely hooked the one that was being trolled into the hook rest and unhooked what he thought more suitable. Thus the "changing of flies" was quick and easy. Also if, while in the midst of a

school of bonito, a hook carried away as it sometimes did, another hook was immediately unhooked from the rest and dropped into the water without hauling in the rod or losing time in bending on a new hook. Only one hook was attached to the short *matila* rod. More than one was strictly prohibited (*sa lava*).

There can be little doubt that the long rod with many hooks is a development from the shorter rod with one hook. The name *matila* (Maori, *matira*) is a widely spread Polynesian word for a fishing rod while *launiu* (coconut leaf) is a later word used to denote the later development which probably was associated at first with different status in rank. Bonito fishing was a chiefly pastime and the *launiu* with many hooks was probably restricted to chiefs while others used the shorter *matila* with one hook. In the Samoan dialect, the older, widespread Polynesian words are the common language and the so called chief's language has coined new words that have a purely local significance. As time went by, the restriction in the use of the *launiu* disappeared but the restriction of one hook to the *matila* persisted.

Bonito fishing takes place only from a bonito canoe. The use of the special parts of the canoe can now be followed. When the canoe paddles out, the rod with its equipment of lines and hooks, rests horizontally across the booms on the rod rests. When the fishing grounds beyond the reef are reached, the rod is lifted up by the steersman who is also the fisherman. The appropriate hook is unhooked from the hook rest and dropped into the water and the knob projection on the lower end of the wooden handle is inserted into the sennit loop at the back of the steering seat. The rod is then rested on the groove in the rod post (*pou 'ofe*). In Savaii, we have seen that the rod posts on the stern cover are wider than usual and have two rod grooves, the one on the right being at a slightly lower level. In such canoes, there are also two sennit loops attached to the back of the steering seat. The canoe may then carry the two types of rod at the same time, the short *matila* being on the right and the longer *launiu* on the left. The lower groove on the rod post supports the short rod at a different angle. It is thus possible for the steersmen to reach round with the right hand and grasp either of the rods. Both rods have to be swung round on the right. The short rod with a shorter line and at a lower elevation can be swung in without interfering with the other. The longer rod at a higher elevation and a longer line can be swung in to the right above the shorter rod without any confusion. In Tutuila and Manua only one rod is use.

Two rods were formerly used but they have been abandoned in favor of one. The advantage of two rods is, of course, that there are two hooks out and at different distances from the canoe. The diagonal rod (*pu'enga* or *manu*) between the rear boom and the left gunwale of the canoe forms a hold for the left hand as the steersman swings in the rod with the right.

Diversity of opinion exists between eastern and western Samoa as to the names of the sennit loop and the handle knob which it supports. Both agree that the loop attached to the seat is the *futia*. The handle knob is termed *umele* in eastern Samoa and *muli tuitui* in western Samoa. In *muli tuitui*, *muli* means the end or bottom of the handle and *tuitui* is from *tui*, to thread or pass a point into a hole. The term *umele* is used in western Samoa to denote a piece of sennit braid which is passed through the *futia* loop and tied in a loop around the rod post. The *umele* loop is adjusted so that the *futia* loop cannot be pushed down by the weight of the rod. Much argument was provoked by asking for the meaning of the well known saying, "Ua o fa'atasi le umele ma le futia" (The *umele* and the *futia* have fitted together as one).

The easterners naturally held that it meant that the projection on the lower end of the handle had fitted into the sennit loop and all was ready. The westerners held it to mean that the rod post loop and the rear seat loop had been fitted together and everything was in the right position for the rod. The easterners do not use the rod post loop and therefore the term *umele* is definitely restricted to the handle knob. The westerners maintain that without the rod post loop or *umele* the *futia* loop is pushed down and the rod end jammed under the seat. It is, therefore, less sensitive in transmitting impulses or pulls from the top of the rod to the lower end. The significance of this is that the steersman as he sits on the seat also rests against the lower end of the rod behind him. He does not hold the rod when endeavoring to keep pace with a school of bonito. Both hands are fully occupied in vigorously plying the paddle for he has to steer the canoe as well as paddle. He, therefore, pays no attention to the rod while the hook is merely trailing in the water. When, however, a bonito takes the hook the backward pull comes on the end of the rod.

The rod post acts as a fulcrum and the lower end of the rod is levered forward. The forward thrust is conveyed to the part of the steersman resting against the rod. He immediately drops his paddle in the canoe, reaches around with his right hand, grasps the rod, pulls it towards him and lifts the self-hooked bonito out of the water. With a circular sweep to the right he pivots the rod in the *futia* loop and swings the fish in from the right into the canoe. To brace himself, he holds the diagonal hand rest with his left hand. The bonito drops off readily as the hook has no barb, or a forward member of the crew removes it. The steersman drops the rod back on the rod post, picks up his paddle and while keeping up the strenuous race with the school, he awaits the next forward impulse of the rod. The rod post loop by keeping the *futia* loop up makes a more sensitive trigger and is evidently a western improvement. The term *umele* is more likely to be originally associated with

the older usage. Regardless, the above saying refers to unity having been secured for action.

Methods of fishing. The method of bonito fishing from a canoe with a trolled hook is termed *alonga'atu* or *alofanga*. To go out bonito fishing is *alo* and hence the bonito canoe is *va'a alo*. In eastern Samoa, the crew consists of three, but in Savaii, usually two. The fisherman in the stern seat is the steersman and has to paddle as strenuously if not more than his companions. With three, the bowman is the lookout and the middle man uses the bailer every now and again. The *tali tata* ridges to protect the bottom lashings from the bailers are just in front of the middle seat. The bonito go in schools (*ingafo*) in search of food. The lookout watches the sea for signs of the school in the ripple of the surface and heads showing up. Detecting signs he calls back, "Up with the rod." The steersman puts up (*langa*) the rod and drops (*lafo*) a hook in the sea. According to Kramer (18, vol. 2, p. 197) he calls at the same time, "Uu." Then he calls, "'Ai se 'atu" (Bite, O bonito), and the bonito bites. As the fisherman swings in the bonito, he calls, "'Atu lea" (There's a bonito). Then the exultant cry of "Tue" is raised which, in full, according to Pratt (23, p. 334) is "Tu ! tu ! tue ! Ua sisi ma tue sisi ma tue le va'a." The skilled fisherman always swings the fish in on the right side and lands it in the middle of the canoe where it either drops off the barbless hook or is removed by the middle man. It is said that some fishermen are skillful enough to flip the rod so that the hook jerks free in mid air while the fish lands in the canoe. Time spent in unhooking a fish is time lost. Where every second is of importance while on a school, a barbed hook would be a drawback and not an advantage. There was thus no incentive to invent barbs for bonito hooks. Sometimes, however, through the angle of canoe and fish being wrong, the fish had to be landed on the outrigger side. Hence the saying to excuse mistakes: "E poto se tautai, 'ae se le 'atu i ama" (Though the fisherman be skilled, yet will a bonito be landed on the outrigger side).

A watch is also kept for flocks of sea birds which pursue schools of small fish to whirl and swoop down on them. The direction of flight is noted and the canoes race to intercept them. If once the canoes can get above the fleeing school of small fish and keep pace with them, the trailing hooks will be amongst the pursuing bonito school. They then take the hook as fast as it is dropped back into the water. It is here that the lightness and speed of the bonito canoes is required. The fishermen make the most of their time while in position for there may be weary miles of paddling before such an opportunity occurs again. Once the school gets past the canoe, the hooks trail in untenanted water.

When the first bonito was landed in a new canoe, the phrase used was, "to'ia le liu" (the hold has been struck). Many sayings are associated with bonito fishing. One is drawn from the fact that bonito chased by a *sa'ula*

(sawfish) will often take cover close under a bonito canoe. The sawfish remains a little distance off watching for a movement of its prey while the bonito, fearful of moving, in turn watch their enemy. The Samoans will never attempt to catch the bonito, not from any sporting instinct, but for fear that the sawfish may charge if it sees the bonito being taken out of the water. Hence the saying of a hard-pressed man to a more powerful chief: "O lo'o tuli mata'i nei le 'atu i le sa'ula" (The bonito is now carefully watching the sawfish). In other words, "It is your move."

In season, the bonito canoes go out in a fleet during the dark so as to be out on the ground at daybreak. This early departure is termed *fa'aao.*

On days when the fleet does not set out from villages close to the reef, the bonito canoes are nevertheless kept ready under the trees above high water mark with the rods on the boom rests and the paddles in the canoes. Someone or other is constantly scanning the sea and on the appearance of any flock of sea birds, the cry is raised. The crews dash from their huts, launch their canoes, and are off at full speed to get in the line of the flight.

The work, however, is strenuous and canoes are often out all day without any luck. They often paddle long distances far from land. It was seeing a fleet of bonito canoes far out at sea that caused Bougainville to call the Samoan Group the Navigator Islands. The people seen were not navigators but simply fishermen pursuing the deep sea bonito. Manua claims to have the most skilled fisherman as regards getting large numbers. It is said that on occasion, the canoe becomes so full of fish that the crew get overboard to make room and guide the canoe in through the reef by swimming. Such an event was considered a great honor to the crew of the loaded canoe.

Bonito seasons. The seasons for catching bonito correspond to the breadfruit seasons, of which there are three during the year.

1. Beginning of the year—January and February.
2. Middle of the year—May, June, July.
3. End of the year—October, November, December (part).

During the month itself, certain days are particular fishing days, and the bonito caught or sought after are named:

'Atu pulapula.	Bonito of the new moon.
'Atu fa'afitu.	Bonito of the 7th day.
'Atu oa toa.	Bonito of the full moon.
'Atu o ngafoa.	Bonito of the half moon waning.

The bonito sought at the end of the month when they are scarce are named *'Atu o le sela ma le miti loa.* The term *sela* is to be tired and *miti loa,* the perspiration which drips down from the nose while the crew keeps on doggedly paddling. Thus, it is the "bonito of weariness and profuse perspiration."

Lucky hooks. The hook that figures prominently in old traditions and and is used figuratively to denote good fortune is the *auamanu* while that which brings misfortune is the *auamala*. There is a myth about a rock in a river in Savaii to which the bonito come and leave a portion of their flesh as an offering. If a bonito is caught off Savaii with a portion of its flesh missing, it is held to have been to the rock. Such a fish caught on a new hook is a lucky omen for the owner. His hook has stood the test and will henceforth be lucky. The subject of lucky lashings has been mentioned. An unlucky hook is looked upon as being wrongly lashed (*fausala*).

Mistakes. When a hole is drilled in a hook and is not used in the lashing it is obvious that it has been the result of a mistake or an unsuccessful experiment. A bonito hook in Bishop Museum has two transverse holes through the head. One is 20 mm. from the head point and one is 26 mm. Dr. C. M. Cooke, Jr., of Bishop Museum, as a result of much practical experience in making artificial baits for trolling, states that if the snood is lashed too far from the head end of the shank, the hook will dart laterally too much when trolled. It resembles the pull of a fish. The only way to correct it is to shift the head lashing nearer to the end. This is exactly what has been done in the Samoan hook. The hook was lashed to a hole drilled 26 mm. from the end. Another hole was subsequently drilled 6 mm. nearer the end and evidently gave satisfaction for the snood remains lashed to it.

HAND LINE TROLLING HOOKS

The hand line trolling hook (*pa ala*) is smaller than the bonito hook but like it is a composite two-piece hook with a shell shank and a turtle shell point. It is trolled from a canoe outside the reef with a line but no rod is used. The fishing usually takes place in the early morning and the fishermen have to wake very early in order to be on the fishing grounds when morning breaks. The *pa* hook is thus named *pa ala* from *ala*, to wake from sleep. For a similar reason, the method of fishing is termed *alafanga* but it must not be confused with *alofanga* (to fish for bonito).

Shell. The shank is made from various shells. Pearl shell is rarely used. The best types are made from *pala'au*. This forms the material of the five hooks presented by the Ripley family to Bishop Museum. Other shells used were the *fatuaua* and *foafoa*. Dr. C. M. Cooke, Jr., identifies the Samoan shells as follows:

Fatuaua	*Spondylus ducalis* Chemnitz.
Foafoa	*Cypraca mauritiana* Linnaeus.
Pala'au	*Perna costellata* Conrad.

Shanks and points. Two types of shank are made: with a rounded head, if the kind of shell used is thick enough, or flat throughout if it is not. The

round-headed shank (Plate XLVII, *B*, 6 and 7) is made of *pala'au* shell cut a rounded head while the ordinary thickness forms the tail. (See figure 290, *a-d*.) The flat type of shank (Pl. XLVII, *B*, 8) is made from *fatuaua* and in such a manner that a thick part of the shell provides sufficient material for other shells which are not thick enough to form a rounded head. (See figure 290, *f-i*.) The thickness of material influences the direction and number of holes for the lashing of the snood to the head of the shank. In the rounded heads, which may be 10 mm. thick, a single hole from side to side is bored through as in the case of bonito hooks. In the flat heads, which are 5 mm. in thickness at most, a hole has to be bored through from front to back on either side of the middle line to provide entrance and exit holes for the lashing to pass around the snood. In five *pa ala* in Bishop Museum, the length of the shank ranges from 47 to 62 mm.

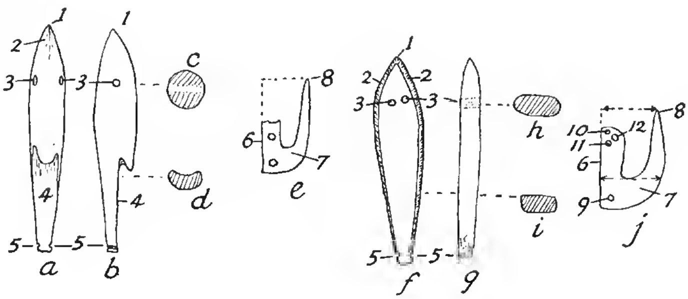


FIGURE 290.—The *pa ala* hooks (two types of shanks with points: *a-e* round shank and point; *f-j* flat shank and point): *a*, Front of round shank, 62 mm. in length and 4 mm. wide at lower end; pointed head end (1) with short upper median edge (2) and hole (3) bored transversely through head; lower part (4) of ordinary thickness with natural inner surface of shell exposed and grooves (5) on sides for lashing the point. *b*, Side view, showing thicker head part and thin lower part, 2 mm. thick at end. *c*, Section through head at hole level, round, transverse and vertical diameters both 10 mm. *d*, Section of upper end of lower part; front surface, concave; back and sides, convex; width, 9 mm.; thickness, 5 mm. *e*, Turtle shell point; straight base (6) for fitting against front of shank, 13 mm. long; two holes for lashings; bend (7) and sharp point (8) without barb; greatest length, 25 mm.; width between point and line of base produced, 12 mm. *f*, Front of flat shank, 57 mm. long; pointed head end (1); convex sides (2) showing; two holes (3) bored through from front to back, on either side of middle line and not necessarily on the same level; grooves (5) on sides at lower end for lashing. *g*, Side view, showing thin nature of shell throughout which does not exceed 5 mm. in thickness; transverse single hole thus impossible and replaced by two holes from front to back. *h*, Cross section near holes; sides well rounded off, convex; width, 13 mm.; thickness, 5 mm. *i*, Section lower part of shank, showing steeper sides; width, 10 mm.; thickness, 5 mm. *j*, Turtle shell point; straight base (6), 21 mm. in length; bend (7) and sharp point (8) without barb; greatest length, 27 mm.; width across inner angle of bend, 16 mm.; width between point and line of base produced, 15 mm. Most points have two holes, but the point figured has four. The two holes (9, 10) are the lashing holes. The hole to the outer side (12) was evidently made for the snood but being unsuitable another hole (11) was bored to which the snood is attached in the actual hook.

The points are made of turtle shell 3 mm. thick and of the same shape as the bonito hooks with a long base, bend and sharp points without barbs. Demandt (9, Pl. IV) figures a *pa ala* hook with a barb on the inner side of the point but it is not the normal technique and has probably been due to foreign influence. The hooks are still made and it would be an easy matter for a craftsman to copy the metal barb of a trade fish hook. Holes are drilled through the base of the point and the normal number is two, as in the bonito hooks. The point in figure 290 *j*, has four holes; two for the lashings, a third special hole for the snood, and a fourth without use. The provision of a third hole for the snood is not normal and may be regarded as a later development but whether it took place before native pastors and others introduced innovations from other areas, it is difficult to say. The fourth hole is due to faulty judgment in placing it to the right out of alignment with the two lashing holes which altered the line of pull. On tying the snood to it, the hook proved unsatisfactory and another hole had to be bored in the same line as the two lashing holes. The fourth hole (third in order of boring) thus became useless, serving no purpose except to indicate that mistakes are made. Had the unlashed point found its way into a collection, an ethnologist would be tempted to say that there were three lashing holes and a hole for the snood. Departures from the normal that are difficult to explain may thus be due to simple mistakes as well as freaks of genius. (See fig. 290 *e*, and *j*.)

The lashing in the usual two-hole point follows that used in the bonito hook but there are usually less turns through the holes and round the shank. The inner lashing (*fausanga loto*) may not have the transverse *langolango* turns. The fibre hackle fixed by the outer end lashing though present is smaller and shorter, ranging from 7 to 10 mm. in length. It is not fixed transversely by special *sele* loops as in the bonito hook. The fibre is laid longitudinally along the back of the shaft and included with the shaft in the first turn of the end lashing (*fausanga i'u*). The end towards the head is then doubled back and the subsequent turns of the lashing pass over both limbs of the hackle concealing the doubled-over part.

The snood is formed by the end of the length of line to be used in trolling and is composed of a three-ply twisted cord of *fau songa* which is much finer than the snood of a bonito hook. In the two-hole shank it is passed through the inner hole. It is tied with a single knot and the short end is doubled back along the snood to be pushed under a raised ply near the head as in the bonito hook. A long *alaala* fine thread is tied to the inner hole and wound round the snood for a few turns. A small white feather is laid on each side of the snood with the quills towards the head but not reaching the head hole. The thread is wound spirally round both quills and snood and a couple of half hitches made to firmly fix the feathers. The thread continues the turns round the snood. Above the transverse head hole, the thread passes down

through the hole and some turns are made over the snood and through the hole, finishing up with crossed turns over the snood and transverse turns between the snood and the shank and round the lashing as in the bonito hook.

In the flat shank the lashing is similar, as the snood passes between the two head holes. In making the turns over the snood, the thread passes down through one hole and up through the other.

In the *pa ala* lashing, the thread does not pass directly from the inner hole of the point to the head hole before twisting round the snood as in the bonito hook. Various extra turns to those described are made with the fine thread in some hooks.

In the three-hole point, the inner lashing is made through the innermost of the three holes while the snood is passed through the middle hole. The two limbs of the snood then pass back to be tied in a single knot beyond the head end of the base of the point. In passing back, the snood covers the inner end hole and it may not be noticed at first that there is a third hole.

The line. The fine line which is continuous with the snood is 9 or 10 feet long and is called the *matai afo,* which really means the head or leader of the fishing line. This is joined to the *afo* (line) which consists of five-ply sennit braid about 22 feet long. The join is made by tying an overhand knot on one end of the sennit line and then another overhand knot about an inch further back. The end of the fine line is stoppered with an overhand knot and then tied round the sennit line beyond its inner knot with an overhand knot. A couple of half hitches are then made around the sennit line between its two knots and the join is complete. The other end of the sennit line is stoppered with an overhand knot and then tied around its standing part with another overhand knot to form a long loop.

When not in use, the sennit line is wound up in long loops as shown in Plate XLVII, *B,* 6 and 7, and the fine line wound transversely around one end for a number of turns, tied in a half hitch and finished off in transverse turns around the other end. Another half hitch is made and the hook point stuck under the transverse turns. Numbers of these lines characteristically wound up have found their way to museums and have been confused with bonito lines and hooks. The *pa'ala* is always attached to a fine *fau songa* twisted line and the line lengthened by five-ply sennit braid. The bonito hook is never attached to such a line and when not on a rod, is attached to a short snood of much thicker cord.

Feather hackle. More than two feathers may be attached to the snood. The quill ends may reach the head hole and some of the barbs included under the crossed turns over the snood. The tips may cover the point. Stair (33, pp. 203, 204) was surely in error when in describing bonito fishing he states that the shell hook was furnished with white feathers on either side. He has confused the *pa ala* hook with the bonito hook. Feathers are not attached to the

snood of a bonito hook but the hackle consists of fibre attached to the back of the shank by an addition to the end lashing. Beasley (1, p. 23) has accepted Stair's statement, hence this correction. Turner (41, p. 169) in describing two small white feathers as fastened alongside the hook, goes on to say that the hook was cast adrift at the stern of the canoe with a line of twenty feet. He thus correctly describes fishing with the *pa ala* and not bonito fishing as Beasley justifiably inferred from Stair's account. In Turner's description there is no mention of a bonito rod as the method Turner was describing was not bonito fishing.

Method of fishing. Fishing takes place in the early morning, commencing at about 4 A. M., or in the evening from 5:30 P. M. to 7 P. M. The small *paopao* canoes are used in the trolling which takes place outside the reef. The slip loop on the end of the sennit line is tightened around the big toe to fix the line. Movement but not speed is required as there is no racing school of fish to keep up with. Because it is less strenuous, the method is freely indulged in by chiefs and is regarded as a chiefly pastime.

The line is dropped overboard and the canoe may be paddled with both hands as the line is attached to the big toe and any bite can be felt by that member. The usual way, however, is to pick up the line with the right hand and give it a pull now and again (*fa'atata*) while the left hand keeps the canoe moving with the paddle. The method was seen in use inside the lagoon at Savaii. While the left hand paddled, the line was given a number of pulls to move it more quickly through the water. It was also brought in to the canoe and then cast out to its full length. The principal fish caught was the *malauli.*

Kinds of hooks. A number of names indicating color and material are given to the *pa ala* as with bonito hooks. Demandt (9, Pl. IV) pictures a number of hooks and shanks duly named. Four round shanks evidently made of *pala'au* shell are named *ulutoto* or *laveuli, lavelei,* and *ululalafi.* The term *ulutoto* (*ulu,* head; *toto,* blood) evidently refers to the dark markings of the shell at the head. Three flat shanks are named *lau, pa ala, sina,* and *foafoa.* The *foafoa* hook is figured with two pairs of holes through the head. From appearance, the lower pair is misplaced by being too far back from the head point and thus causing side darting when trolled. To correct this, the craftsman bored the second pair very close to the point, unnecessarily close probably owing to the previous mistake.

HAND ROD TROLLING HOOKS

The *pa seuseu* (Pl. XLVII, *B,* 9, 10), the smallest of the four types, is attached by a line to a hand rod which is repeatedly cast and drawn in as in angling for trout. The motions of casting and drawing in is called *seuseu* and gives the name of *pa seuseu* to the hook. Owing to its small size it is also called *pa laiti* (*laiti,* small).

Shell. The hook is a two-piece composite hook with a shell shank and a turtle shell point originally. The old time point has now been completely superseded by small trade fish hooks of metal.

The shank owing to its smaller size with no problem of a deeper head is made from any of the shells enumerated with the bonito and *pa ala* hooks. The edges and left over pieces are also utilized. Demandt (9, p. 29) enumerates other shell material as *'ali'ao* (*Trochus*), *alili* (*Turbo*), *faisua* (*Tridacna*), *fole* (*Pinna*), and *tofe* (*Perna*). The *fole* seems rather thin material but it is evident that in small hooks, any suitable shell was used. Owing to the small amount of material required to form a shank the range of shell material was vastly increased. Different districts utilized the available shell along their coast boundaries. The *tupe* (operculum) of the *alili* (*Turbo*) is also used. The use of the various shells was to get different shades of color. Demandt (9, Pl. III) pictures a fine assortment of shanks arranged according to color and material.

Shaping. The shell is now shaped with the saw to a long rectangular form and the back rubbed down on a stationary grindstone kept wet with water. Two holes close together and in the same transverse line are bored through at one end with the Samoan drill. The rubbing down of the back passes through three stages: first it is rubbed flat until it approaches the required thickness; then it is rubbed at a slant on either side of the middle line so as to form a median longitudinal edge; lastly the median edge is rounded off. In the last stage, the shell is frequently dipped in water to clean it and held up to the light to see that it has the right shade of color. The different color of the outer surface of the shell is carefully ground off towards the sides in some hooks so as to leave a median streak or a patch near the head which is looked at from the front when it shows up through the inner clear surface of the shell. The required shade being obtained, the sides are shaped to a point at the head end and a narrowing slope towards the tail. The wider head end is for the holes. The thickness of the shank thus varies according to the shade of color required. The shape of the shank varies considerably as shown in figure 291.

Lashing. The original points of turtle shell are rarely seen now and never used. Demandt (9, Pl. III) pictures one which is reproduced here in line drawing. (See figure 291, *e*.)

Though Beasley (1, p. 25) characterizes the modern hook as "the last word in decadence," they are lashed by native technique. As illustrating adaptation and progress of a kind, the technique is worthy of description. (See figure 291, *f-h*.) A metal hook of appropriate size to fit the shell shank was selected. The end of the three-ply *fau songa* line was used as a direct snood with *pa ala* hooks.

The true Samoan point was probably fixed to the shank in the same manner as with the hand line trolling hook with a flat shank and two holes. (See figure 290, *f-j*.) Demandt's hook, however, is exceptional in showing a thick shank with the hole running from side to side.

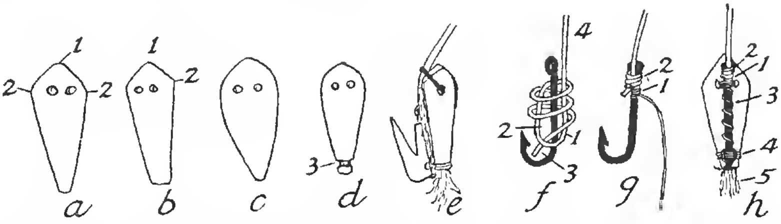


FIGURE 291.—The *pa seuseu* hook: *a, b,* shanks with mesial head point (1) and two lateral points (2); *c,* shank with lateral points rounded off; *d,* shank, with rounded lateral point, and deep groove for lashing cut around lower end, which is converted into a short knob with a constricted neck (3); *e,* Demandt's hook with turtle shell point. *f,* Stages of attachment of modern fish hook to shell shank: holding the hook in the left hand with the hook eye distal, one end of the line was laid along its shank from the eye downwards (1) and the left thumb placed over it. The short end of the line is doubled back towards the eye leaving an open loop (2). From below the eye, the short end takes two or three spiral turns around the shank and the doubled line and is then passed through the open loop (3). The long end of the line (4) is pulled and the turns tightened. The line is thus fixed to the shank of the metal hook. The line at no time passes through the eye of the hook but the expansion of the eye prevents the tie from slipping off. *g,* A thin twisted thread (1) is tied by one end to the hook shank just below the eye and clear of the line knot (2). The short end is disregarded and with the long thread a number of half hitches are made round the shank to fix the thread firmly. *h,* The hook is now placed on the front of the shell shank with the part carrying the thread between the two holes. The thread is passed down through one of the holes, back up through the other, crossed over the hook shank and so continued for a number of turns. When sufficient, the thread is passed through its own loop to make a simple knot. A couple of circumferential turns are taken around the lashing between the hook and the shell shank. Each turn should pass through its own loop though this is not always observed.

The thread is run spirally (3) around the hook shank towards its bend. When it is opposite the narrow part of the shell shank end or above the groove if there is one, a number of half hitches are made close together around the iron shank to fix the thread ere commencing the end lashing.

A hackle is formed from pieces of *fau songa* fibre, bits of feather or even foreign cotton thread. The hackle material is laid longitudinally on the back of the shank with its middle opposite the lashing point. A turn is taken with the thread round the shell shank and passes over the hackle. The end of the hackle towards the head is doubled back and the subsequent turns (4) of the lashing pass over both limbs of the hackle (5) and fix it. The hook is also fixed to the shank and a couple of transverse turns each passing through its own loop are made around the lashing between the metal hook and the shell shank. The thread is thus fixed and the extra length cut off. The hackle is also trimmed off fairly short.

Use. The hook with an appropriate length of line is tied to a light bamboo or other wooden rod. The fishing takes place usually between the reef and the shore and this form of fishing is termed *aloalo* as well as *seuseu* which gives the hook the alternate name of *pa aloalo*. Generally fishing takes

place from a *paopao* canoe. In Savaii, most of the *paopao* canoes were fitted with rod rests on the float and boom to carry the rod when not in use. As stated, the fisherman makes casts with his rod, draws the hook through the water towards the canoe or parallel with the side and casts again. Where the water is not too deep, the fisherman wades about with his rod and puts his catch into a basket tied around the waist. On calm days, he may stand on the outer edge of the reef and fish in the many clefts and small channels with which the reef is seamed.

A large range of the smaller fish were caught such as the *ngatala, matamu, malai, matalau, 'ata'ata, umiumia, sungalupe,* and *patangaloa.*

USAGE AND CUSTOM

The sexes. The sphere of the two sexes in fishing was clearly defined. Women spent quite a lot of time in the lagoon but the methods open to them were restricted. A woman's ordinary field kit consisted of an *ola* basket slung over her back or around her waist, a strong *mele'i* pointed stick for prising up stones and shell fish and a slender rod (*la'au sao*) for driving squids out of their holes. With this equipment she searched the shallow parts of the lagoon and the dry reef at low tide. The *tu'u'u* trap and groping under rocks formed other methods. In company with others, the *ola tu* plaited basket was used as a manipulated trap around the stone heaps and in connection with battering the branching coral *amu.* She also assisted on occasion in driving with the long leaf *lauloa* and in these days she may be seen assisting to drive into the shorter nets placed across channels.

To men all methods beyond the strictly female methods were open. In individual fishing he pleased himself but in community methods there had to be a leader who by experience and recognized authority could decide what methods were to be used, when and where, and take command over those engaged. This need created the position of the head fisherman (*tautai*).

The head fisherman. It does not appear that the Samoans delegated fishing to one particular class who did nothing else. The whole male community indulged in fishing including high chiefs if they so desired. Fishing was a sport as well as a food procuring activity. Some of the community methods were occasions of fun and excitement and corresponded to a combined picnic and sports gathering that took place in that most important Polynesian playground, the lagoon. All experienced fishermen were classed as *tautai* but amongst them one was elected by common consent to the position of head *tautai* of the village. In a large village with distinct divisions or groupings, each division might have its own *tautai.* The heads of families met in a guest house, and over a bowl of kava decided according to the season what form of community fishing should take place, as quantity or shoals of particular fish could only be secured adequately by the cooperation of numbers.

In these gatherings, the *tautai* naturally assumed command. In the community methods in the lagoon or outside the reef, the head *tautai* was in absolute command. He was the chief and men of higher rank and authority on shore were inferior to him on the realm of the sea. A clear cut distinction existed between the two spheres of influence. The authority of the *tautai* did not extend to the land except, of course, in the preliminary arrangements connected with fishing.

The distinction was conveyed in a saying which amounted to a law.

E le au le va ngauta i le va ngatai,	The authority of the land does not apply to the sea,
E le au le va ngatai i le va ngauta.	The authority of the sea does not apply to the land.

The authority of the *tautai* is best exemplified by the bonito fleet.

The bonito fleet. The bonito canoes usually go out in a fleet over which the *tautai* assumes command by right of his position. He selects the grounds to be visted and decides on the movements at sea. If a high chief accompanies the fleet, he does so as a private individual. His social position as a chief, however, is recognized by giving him the first bonito caught on the first morning that he accompanied the fleet. If he is of very exalted position, he gets the first fish on the second morning. Full respect having been paid to his shore rank, he lapses to the position of ordinary fisherman with the others. His authority remains on the land and right from the beginning he obeys the commands of the *tautai*. The first fish given to a high chief as a purely ceremonial form of respect is termed *ngalongia*.

When the *tautai* decides that it is time for the fleet to return to the shore, he raises his paddle as a signal and all obey. Before reaching shore, the *tautai* further exercises his authority by making a levy (*aleanga*) on the fleet. He takes from the successful canoes, one or more bonito according to their catch. The fisherman with moderate success goes free if his catch is small as compared with that of others. The *aleanga* is not for the *tautai* but to form the material for a community feast for the fishermen in which the unsuccessful member shares equally with his more fortunate fellows. The *tautai* in making his levy calls to each canoe, "How many?" On the reply he demands the appropriate number which are thrown into his canoe. He cannot always see what is in each canoe. If, however, it subsequently transpires that a fisherman has avoided the *aleanga* by giving a wrong account, he suffers the penalty of departing from custom in thus not recognizing the authority of the *tautai*. His bonito canoe is broken up and his fishing gear confiscated to the *tautai*.

There are two forms of mobilization of the bonito fleet over which the *tautai* rules. One is the fleet that goes out in the early morning to get on the

grounds by daylight. The other form is used by villages close to the reef which can see a good stretch of ocean. The canoes are kept in readiness above high water mark with the rod on the outrigger rests and the paddles and seats in position. These waiting canoes are called *alei* or *va'a alei.* Watch is kept for the shoals (*ingafo*) of bonito which follow shoals of small fish and whose presence is shown by the flocks of sea birds which follow. When the flock of sea birds is seen, the signal is given, the canoes are quickly launched, and the fleet is away under the command of the *tautai.*

Limitation of power. The *tautai* rules over a community acting together. His authority does not apply to the individual acting away from the community. This is illustrated by the individual canoe termed *tulialo* or *va'a tulialo.* While the fleet is out, a chief, seeing a passing flock of birds, may send a bonito boat out to try its luck. Should the *tulialo* canoe come up with the fleet it does not come under the authority of the *tautai* as it did not enroll, so to speak, with the fleet by mobilizing with it. This is recognized by the *tautai* for he cannot demand the *aleanga* levy from it. The individual canoe is responsible with its catch to the chief who sent it. In this way, in spite of the law limiting the sphere of influence of the land authority, the chief still exercises some authority but it is very limited and does not clash, in the Polynesian mind, with the sea authority exercised by the *tautai.* The *tulialo* canoe does not exist as far as the *tautai* is concerned and it is only accident that brought it in the vicinity of his fleet.

Observances. In addition to main principles, there are a number of observances that must be carried out and so become established as custom. Such are those based on hospitality, but enforced by custom for those who are not innately hospitable.

Fishermen, on coming in, must give a fish or a portion of fish to anyone they meet in the water of the lagoon or on the shore. These people, of course, have not been fishing, and are termed *tui atua.* The share given to them is termed *tufaanga sa tui atua; sa* means the member of the *tui atua,* and is not prohibited or sacred. By this observance, the people who could not go out are assured of a share. As the fleet comes in they go down to meet it and obtain the *tufaanga sa tui atua* as their right. Custom saves them from the opprobrium of being regarded as mendicants.

The custom applies equally to men of rank such as chiefs and talking chiefs. They have only to meet the fisherman anywhere on his journey to his house and the fishermen have to recognize their superior position by giving them of the best.

Prohibitions. There are always prohibitions in fishing as in other activities to avoid bad luck and form an excuse for ill success though the latter reason is not verbally expressed.

In bonito fishing, as in netting mullet, the fishermen wore nothing but a ti leaf kilt in olden days, and now wear nothing but a cloth kilt. The upper body must be bare. Nothing must be worn on the head except lime which is used as a protection from the sun. The *taumata* eye shade is allowed. Other prohibitions exist such as not spinning the paddle in the air, leaning back in the seat or stretching the legs over the topsides. The last is termed *sapoliu*. There are also pre-fishing prohibitions: the craftsman making a bonito hook must be seated on a pile of mats and not on the floor and no noise must be made in the vicinity while he is making or lashing. A means of magnifying the importance of the hook maker and insuring it by the threat of non-success to the hook if the respect is not duly paid can be seen in this last prohibition. Many other prohibitions have probably been in force, but have not survived the clash of cultures.

As regards food prohibitions during fishing, the Samoans did not have any as evidenced by the fact that the cooked food *fu'efu'e* or *lafoa'i* was taken out on bonito fishing expeditions.

Status of bonito. That the bonito had some status amongst fish is indicated by the use of special words such as were created around the rank of chieftainship. The common name of bonito is *'atu,* but it also has the poetic and honorific names of *pau* and *pa 'umasumu*. Large as applied to a bonito is not *tele* but *sumalie*. In counting them, they were grouped in tens expressed by prefixing *tino* to a unit as *tinolua* (twenty bonito).

Hook obtaining custom. The custom of obtaining ready-made material from some one else applied to bonito hooks. A master fisherman could call on another with the view of obtaining hooks from him. Such a visit was *malanga fanga*. From such visits, the hooks in active use that were tied to the rod and stuck in the *silinga* were exempt. The total number of hooks *sa'ana* on the rod may have been an inducement to a fisherman to have extra lines on his rod, not only for variety as already described, but to save them from a visiting fisherman on a *malanga fanga*. Should the visitor announce his wish to see his compatriots' hooks, the *tautau* basket containing the spare hooks has to be taken down and emptied out before the visitor. To thus cause a fisherman to turn out his spare hooks is termed *fa'ausu*. The visitor handles and examines the hooks and either directly or indirectly expresses a wish for one or two. The owner makes the best of a bad job and gives them to his visitor. As Tufele of Tau puts it, "He opens his basket and his heart, too." A couple of hooks so given is termed *talanga*.

Shark fishing. There is a large species of shark called *naiufi* that is regarded by fishermen as the king of sharks and treated with ceremonial respect even while planning its capture. If not prepared to noose it on first meeting it, the fisherman makes a speech addressing it as a chief of the highest rank in the terms, "Afio mai lau afionga." He apologizes to it for not being able

to deal with it that night but he will return the next night. The *tautai* gets another bigger canoe perhaps and a better crew if the first one is frightened. As these sharks are said to remain in one area for some time, he returns the next night. The baits are put out, the shark attracted to the canoe, and after much ceremonial speech on the part of the *tautai* the *naiufi* is noosed with the shark rope. The shark is a vigorous fighter and the canoe may be towed miles first in one direction and then in another. Always, however, according to the *tautai,* it returns to die at the spot where it was noosed. Hence the saying, " 'O le i'a e ngase lava i le mea no lavea ai" (The fish will assuredly die by the thing that caught it).

The thing, besides meaning the distinctive object, also carries in the saying the idea of the place where it was noosed. Hence the experienced fisherman will never cut loose no matter how far the fish tows him away, for he is confident that it will tow him back again.

It is a deservedly great honor to kill a *naiufi.* As the canoe comes in, the shell trumpet is sounded from it and the canoe parades backward and forward before the village. The owner meets his canoe at the landing with a fine mat and touches the head of the fish with it. The mat goes to the *tautai* and the fish to the canoe owner and the village chiefs, amongst whom it is ceremonially divided. The *tautai* who has noosed a *naiufi* is forever established in authority. The event may even have a bearing on the appointment of his son to succeed him after he has retired. In an argument between two aspirants, the decision in favor of one is clinched if it can be said, "His father caught a *naiufi.*"

After snaring two of the ordinary species of shark, the *tautai* allows his crew to use the noose.

Distribution of fish. The individual fisherman has the right to his own catch, subject, of course, to the inroads that may be made by obeying the laws of hospitality. In bonito fishing with the fleet, the catch is subject to a levy for the communal feast of the fishermen. In community fishing with narcotics, leaf sweeps, and nets, the head fisherman gets first pick and the catch is divided up into heaps corresponding to the number of families engaged. Heaps are usually put out for privileged people, such as high chiefs, visitors, and in these days, the village pastor. Shark and turtle are divided up with special parts assigned to those with hereditary titles.

Hereditary rights and titles. The position of head fisherman while not strictly hereditary was often transmitted from father to son or a close member of the family on account of their better opportunity of acquiring expert knowledge. Information of practical value as to the habits of fish, favorable or unfavorable weather signs and suitable nights, months, and seasons were acquired by long experience and transmitted orally to succeeding generations of the same family. The acquisition of such knowledge gave a member of the *tautai* family the extra qualification that fitted him for succeeding to the

position of head fisherman. According to Pratt (23, p. 254), the name of the chief fisher at Safotu, Savaii, was *safa'ausu*. The conferring of a special title shows the honor with which the position of chief fisher was regarded, but whether the title was inherited or not by a particular family is not clear. The pride taken by a family in holding such positions would, however, lead to reciprocal efforts between father and son to retain it in the family.

Certain privileges in connection with fishing were, however, held by some families. In the *tu'i* method of fishing at Salailua, Savaii, with the mat cone and leaf sweeps, the fish in the tail end of the *tu'i* were restricted (*sa le i'a*) to a certain family. A cord was tied around the *tu'i* towards the tail end. Of the fish on the entrance side of the cord, the head fisherman got the first pick and the rest were divided up among the villagers.

Some of the privileges, like many of the chiefly titles, are associated with a traditional origin of a mythical nature. Such is the position of *le mata-o-le-i'a* (the watcher of the fish) held by the family of Toaloa in Puapua, Savaii. The title dates from the appointment of the first Toaloa after the introduction of the red-lipped mullet from Fiji by Sina. The watcher signals to the waiting netters when the first shoal of mullet is coming from the east. It would appear that the family of Toaloa have acquired extraordinary eye-sight during the period they have exercised their hereditary duties for the people of Puapua firmly maintain that the present holder of the position can see the shoal coming a mile away. Sina also gave Le Malu the right to rule (*pule*) over the fishing arrangements in connection with her mullet and the right has been exercised by the family ever since.

Sina also brought the *ingana* fish to Savaii and left her brother Faasua-i-au in charge. Ili and Tangoai were appoined guardians of the fish. The three names are titles held in Puleia and their right (*pule*) over the *ingana* is still recognized. If a man wishes to angle for the big fish that have followed the *ingana* shoals in close to shore, he must send a fine mat to Faasua-i-au, who in turn gives it to Ili and Tangoai, the hereditary guardians of the *ingana*.

Another example of an inherited right is furnished by the family of Nuu in Satupaitea, Savaii, which has a monopoly or patent right over the very crude *malauli* hook made from a fish bone tied at an angle to a piece of wood. Anyone wishing to fish for *malauli* with such a hook made his request with an accompanying present to the head of the Nuu family.

The special monopoly exercised by the high chiefs of eastern Polynesia over such fish as the shark and the turtle does not seem to have held in Samoa as a general custom though the Tui Manua would appear to have held some such privilege over the turtle as revealed by the story of the Sasaumani. The Sasaumani tribe of expert fishermen lived originally in Manua but migrated to Savaii through a number of causes among which the theft of a turtle belonging to the Tui Manua played a part.

SNAKES

Snakes are found in Savaii and were plentiful in the Asau district where they were formerly caught and eaten. They were caught by forming heaps of stones (*ma'a*) in the clearings and dealing with them as in the stone heap method of fishing. The deep *ola tu* basket used in fishing was also used for snakes but owing to its function, it was called *ola fai ngata* (snake catching basket). The open basket was held against one side of the stone heap and the stones gradually cleared away from the other thus driving the snakes into the basket.

They were cooked in leaf wrappings in the earth oven and tasted like eels or sea eels according to my informants. They became very fat and the greasy leaf packages after cooking looked as if they contained fat pork. The fat (*nga'o*) of the snake receives the special name of *pipi* and the fat condition is termed *tai taeao.*

The snakes according to the Asau people are non-poisonous as many have been bitten by them without any poisonous results.

HUNTING

Hunting animals is restricted to rats, wild pigs, and the flying fox. In fowling, there is a larger variety of bird life which thus calls forth a greater range of methods and equipment. It is more convenient to deal with the animals first and then with fowling methods.

TRAPS

Both the rat and the wild pig are caught by baited spring traps. In trying to secure the bait, a trigger is moved which releases a running noose by which the animal is secured.

Rat trap (*va'a 'iole*). The rat is named *'isumu, 'imoa,* and *'iole.* The trap itself is *va'a,* and each of the above rat names may be added to *va'a* as a qualifying word. The name in common use is *va'a 'isumu,* but in Manua it is *va'a 'iole* which is held to be the older term. (See figure 292.)

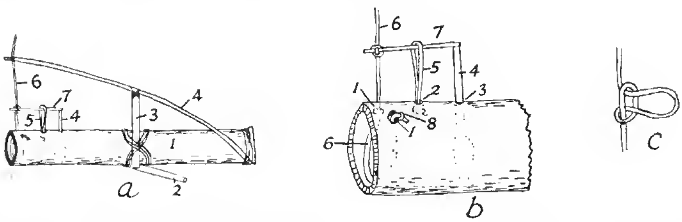


FIGURE 292.—Rat trap (*mailei 'iole*): *a,* the trap is made of a section of bamboo (1) large enough to admit a rat. A node partition is left at one end to prevent the rat entering by the back door. A piece of wood (2) is lashed transversely to the under part of the bamboo to serve as a stand to keep the bamboo from rolling. A rod (3) about 14 inches long is tied to the bamboo and the horizontal rod in an upright position. A long springy piece of wood (4) is tied to the back end of the bamboo and the top of the upright to form the spring. The free end is cut off in line with the front end of the bamboo which forms the entrance. *b,* On either side of the middle line, holes large enough to allow the run of a three-ply braid are bored through the upper surface of the bamboo just inside the entrance (1, 1). A little further in two holes a little apart are bored in the median line (2 and 3). A straight stick (4) is pushed down through the innermost hole (3) to support the bait. A loop of sennit fibre (5) is made and knotted at the end of such a length that when doubled and pushed up through the middle hole (2) it will project above the bamboo to the same height as the bait stick. The loop is prevented by the knot from pulling upwards through the hole. A length of sennit braid (6) is tied to the free end of the spring. The spring is pulled down and tested to find the right tension. At a point opposite the line with the tops of the bait stick and the loop, a slip noose (fig. *c*) is formed in the braid. A light stick (7) long enough to reach the bait stick has one end inserted in the noose which is drawn taut to fix the stick.

The end of the braid (6) is inserted through one of the remaining holes (1, 1) near the entrance, passed around the inner circumference of the bamboo and pushed out through the other hole where it is knotted (8) on the outside and the end cut off.

The trap is set by pulling down the spring, passing the stick attached to the braid through the loop (5) and resting its end on the upper end of the bait stick (4). In this position the upward pull of the spring transmitted through the outer end of the braid stick (7) owing to the fulcrum formed by the loop pushes down the inner end of the

horizontal braid stick. This is prevented by the bait stick which cannot be pushed downwards. So long as the upper end of the bait stick remains immovable, the spring stick cannot fly back. The braid loop within the bamboo entrance is spread out along the sides and bottom so that a rat entering must step over the loop. The bait stick is baited inside the bamboo before the trap is set.

The baited trap with the spring set is placed in the runways made by rats. If in a good runway, the rat will enter the tube even without the attraction of a bait. On entering the bamboo tube, the rat finds the bait or stick obstructing its way. In getting past or nibbling at the bait, the bait stick is moved to one side. The movement of the stick upsets the balance at its upper end and the horizontal tie stick is released. This allows the spring to fly up. The loop is pulled up from the floor and the rat is caught against the roof of the tube by the tightened loop. For a more elaborately lashed rat trap see Plate XLVIII, *A*.

Pig trap (*mailei pua'a*) is still occasionally used in Savaii where wild pigs are to be found back in the hills. The principle of the trap is shown in figure 293.

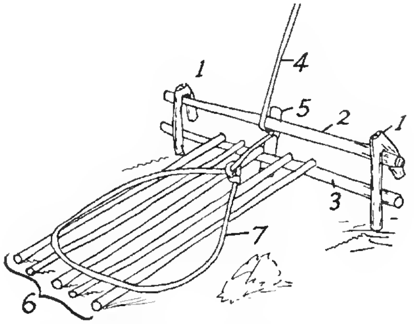


FIGURE 293.—Pig trap (*mailei pua'a*): Two upright stakes (1) are driven into the ground a little distance apart, and a horizontal bar (2) tied to them. A lower bar (3) is placed against the back of the uprights but left free. To the back of the crossbar and some distance away in the middle line, a stout pliant sapling is firmly implanted in the ground in a slanting direction towards the bar. It is so arranged that when bent down the end will be directly above the middle of the crossbar. To the end of the spring sapling is tied a sennit three-ply braid rope (4) with a large running noose. The spring is pulled down to get the right tension and a tie stick (5) tied at its middle to the rope at a point below the crossbar. The tie is formed with the same knot as in the rat trap. The rope (4) is pulled down and one end of the tie stick (5) placed behind the crossbar (2). The lower bar (3) which will be termed the trigger bar is raised from the ground a few inches and the other end of the stick placed behind it. The upward pull of the spring on the rope is checked by the tie stick which is braced by the two crossbars. The rope being in front of the upper bar, the lower end of the tie stick exerts a forward pressure against the trigger bar which keeps it in position against the back of the uprights. A number of bars (6) are now placed in front of the crossbars with one end resting on the trigger bar and the other on the ground. The noose (7) is opened out and spread over the slanting bars (6). The trap is now set. The trap is either made over the track used by pigs or some fence made at the sides with a blind enclosure in which

a bait is set. To reach the bait the pig must pass over the oblique rods supporting the open noose. When the pig's weight comes on one of the oblique bars, it presses down the trigger bar (3) to below the lower end of the tie stick (5). Immediately the tie stick is released, the spring flies up and the pig is caught by the running noose.

NETS

Flying fox net. In Tutuila, near Malaeloa, the flying fox (*pe'a*) was caught in a fowling net with a long handle. The bats lived in a tree down the side of a cliff. In the evening when they went out to feed, they flew up over the cliff and passed through a narrow defile. In this defile, the hunter watched near the cliff. As the flying foxes came up over the edge they were fairly close to the ground. The hunter then intercepted them with the net which he swung (*seu*) in the manner of netting pigeons (*seu lupe*). The method was, therefore, termed *seu pe'a* and is purely local.

HOOKING APPLIANCE

A curious *seu* method prevails in catching flying foxes with a vegetable hook appliance tied to a long handle. The *angaoso* is a creeping plant provided with curved thorns forming natural hooks which curve towards the root end. A number of small branches are cut off in about 30-inch lengths. About 16 are tied to one end of a long handle with sennit braid. (See Plate XLVIII, *B*.) The object is to hook the wings of the animal and by tearing them bring the animal to the ground. They are caught thus in three ways:

1. While feeding on the fruit, such as bananas and breadfruit.

They are very fond of the flower below the banana bunches of the *fa'i pata* kind. The hunter conceals himself near likely trees and allows the bat to alight on the fruit before he hooks it.

2. While flying.

The hunter takes up his position between trees laden with fruit and intercepts the flying fox as it comes to feed in the evening.

3. From a tree platform (*tia*).

The *seu a lunga* method of netting pigeons from a platform in a tree is also observed with the flying fox in Savaii but the hunter has a hook appliance instead of a net.

FOWLING

The birds caught were the *iao*, parrakeet (*senga*), rail (*ve'a*), *manuo*, tern (*ngongo*), dove (*manutangi*), and pigeon (*lupe*). The *iao* and parrakeet are caught with snares by children for fun and the latter are kepts as pets. The rail was shot at with bow and arrow for sport. The *manuo* and tern are both eaten. The *manuo* is caught with a noose and the tern by a net. The trap was used for the dove and both bow and arrow and net for the pigeon. Both

dove and piegon are still plentiful and in olden times were much sought after for food. Wild fowls (*moa vao*) are also trapped.

SNARES

Set snare. The usual slip knot snares with single thick threads of coconut fibre are set on the flowers (*funga*) of the coconut, usually by children. The *iao* is caught merely for fun and also the Samoan parrakeet. The parrakeet becomes very fat in season and is eaten. Its feathers are of no use for mats, being green with only the slightest touch of red on the head. It is, however, kept as a pet and tamed. A perch is made for the pet and the flesh of young coconuts (*niu aleale*) is the proper diet. Coconut fibres knotted together to form a long line were tied to the leg and the birds flown (*fa'alele senga*). The sport was not indulged in particularly by chiefs, but by boys and common people.

A parrakeet is often caught accidentally by the sticky fluid oozing from *pu'a* berries. The feathers become so sticky at times that the bird cannot fly.

Manipulated snares (*sele*). A slip knot snare made of strips of *alava* from the coconut leaf butt and tied to a long bamboo pole was used to catch the young of a seabird (*fuao*). The *fuao* breeds amongst the steep cliffs near Sanata in Savaii. A man armed with a snare is lowered over the cliffs on a rope. The snare handle is needed to reach the young as they sat on the nests in the cliff recesses; the stiff *alava* strips insure the noose being kept open until it is placed over the heads of the young birds. The cliffs were alluded to as being five coconut trees high. The birds were eaten and the feathers used for *pa ala* hook hackles.

TRAPS

Traps consist of one self-acting spring trap and two manipulated traps. The spring trap is used for wild fowls. One of the manipulated traps is used also for wild fowls and the other for the dove.

Self-acting fowl trap (*mailei moa.*) Domesticated fowl (*moa*) which have gone wild are caught by a *mailei trap* which is intermediate in form between the rat and pig traps. The material required is a springy sapling, two stakes about 14 inches long with short pieces of branch left at one end to form a hook, a rod as thick as the finger and 18 inches long, three short thinner rods and sennit braid about 6 feet long. (See figure 294.)

An enclosure is made around the trap with an opening on one side of the noose and a bait on the other closed side. The fowl on entering has to cross the trigger to reach the bait. In doing so, it touches the trigger stick which on moving releases the tie stick and the spring flies up, catching the fowl in the noose.

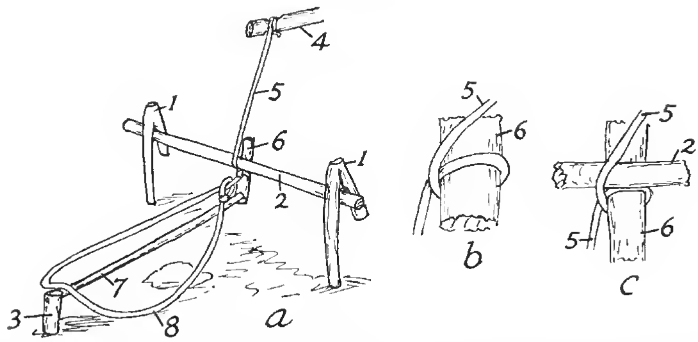


FIGURE 294.—Fowl trap (*mailei moa*): *a*, the two forked stakes (*la'au manga*) which are as thick as the finger, are driven into the ground about 16 inches apart (1) and with the hooks above and facing backwards. The 18-inch rod (2) forms a crossbar (*la'au fa'alava*) which is fitted under the hooks and is about 6 inches from the ground. A short stake (3) called *la'au taofi* is driven into the ground about 10 inches in front of the middle of the crossbar. The spring sapling (4) called *la'au fa'afiti* is driven into the ground at the back at such a distance that when its end is bent down to the required tension, the cord (5) tied to it will be vertically above the middle of the crossbar.

The braid is tied to the free end of the spring and a loop made on the other end. A thin piece of wood (6) called *la'au milo*, about 5 inches long, is used as a tie stick. It is either tied to the braid at the point which touches the crossbar when the spring is bent or it is applied to it in the manner shown. *b*, The tie stick (6) is held upright and a half hitch turn taken around with the braid (5). *c*, Holding the anterior crossing firmly against the tie stick to prevent the spring flying back, the upper end of the tie stick (6) is passed behind the crossbar (2), the braid having passed down from the spring in front of the cross bar. *a*, The tie stick (6) is pushed up so that the crossbar rests against the anterior crossing of the braid and prevents the spring flying up so long as the tie piece remains vertical. It is kept vertical by placing a stick (7) between the short stake (3) and the lower end of the tie stick (6). The third smaller stick (7) of the material assembled is fitted and is about 10 inches long as the stake (3) was placed that distance in front of the crossbar line. The stick acts as a strut and is hence called *te'e*. It is about 3 or 4 inches above the ground where it meets the tie stick and it acts as a trigger. The noose part of the braid (8) is opened out and crosses above the trigger stick. When the trigger is nicely adjusted, it keeps the lower end of the tie stick in the vertical line and the pull of the spring by keeping the crossing of braid on the tie stick pressed against the crossbar keeps the spring down.

Manipulated fowl trap (*fale moa pa'u*). A frame built of wood and likened to a house (*fale*) is propped up on one side by a stick; bait is placed under the house, and a line tied to the prop, the end of which is held by a concealed observer. A decoy rooster may be used also. When the fowl walks under the house to get the bait, the string is pulled and the house falls (*pa'u*). The trap is also termed *fale moa tali, tali* meaning to await.

Much superstition exists in Savaii regarding this form of trap. People are said to have seen fowl enter the house and have pulled the string accordingly. On raising the house, however, no fowl was within while a mysterious voice said, "Oh, you are trying to catch fowl." The unfortunate fowler then sickens and dies.

Decoy dove trap. The Samoan dove (*manutangi*) was caught in a trap like the *tu'u'u* fish trap on a larger scale and manipulated on the same principle. The trap was made of *'ie'ie* roots duly denuded of bark. The single pair twined technique and the general shape was similar to the fish trap. It had to be large enough, however, to hold a decoy bird and the wild bird which was attracted into the trap. The opening was formed as in the fish trap.

The decoy dove (*manu fonua*) was preferably caught young on the nest and reared as a pet. Adult birds injured in fighting have been caught and tamed (*fa'alata*). They were fed on cooked *talo* or breadfruit mashed and squeezed into pellets the size of small cherries. A cage of the type mentioned above was made for them and hung with the opening upwards. A perch (*tulanga*) of cane (*u*) was placed across the inside of the cage. A string of two-ply *fau* bast termed a *lauvae* was bifurcated at one end and a part tied to each leg while the other end tethered the bird which is thus enabled to fly about and return to the cage. The bifurcated part of the cord was termed *manga lua* and the single, long part, *autasi*.

The fowler selected a part of the forest where wild doves were abundant. The cage which also formed the trap was hung up on the branch of a tree within reach of the ground or it was hung to a prepared horizontal perch set on forked uprights. The fowler concealed himself close at hand. The decoy by its calling attracted the wild bird (*manu vao*) which lighted near the cage. A good decoy attracted the wild bird to it and like the *tu'u'u* fish it entered the trap to fight the decoy. A well trained decoy would get above the wild bird in the cage and spread out its wings to close the opening by which it entered. The fowler immediately the wild bird was well within the trap called out in a sharp voice, " 'Ae, 'ae." The wild bird startled by the voice crouched down and in a flash the fowler reached the trap and placed his hand over the opening. From this method originated the saying: " 'Ae 'ae lea manu ua ulu" (Shout at the bird which has entered). It is no use shouting at what is not in the trap. The application is, therefore, be satisfied with what you have got.

A bad decoy sometimes uttered a warning note which kept the wild bird away. This warning note (*tangi to'ia*) is applied to orators who estrange their hearers. Hence the phrase, "Ua fa'atangi to'ia le launga" (The speech has taken an inimical tone). Some decoys brushed the wild bird away and prevented it from entering the cage. Such a bird is termed *manu tafi manu* and the term is applied to a chief who estranges people. In another saying, " 'O le a ngase manu vao 'ae ola manu fonua" (The wild bird will perish but the tame bird will live on), the wild bird represents evil minded people from other villages and the tame bird, the people of the home village.

Among chiefs the trapping of doves became a favorite sport and competitions termed *fa'atau manu tangi* were held for the greatest number caught.

BOW AND ARROW

The use of the bow and arrow has been mentioned for shooting fish but a use that was more important in the estimation of the people was the shooting of pigeons. This higher appreciation of pigeon shooting found expression in sayings and references in speeches, whereas fish shooting is not drawn upon.

The bow (*aufana*). Most Samoan bows were made of *fisoa* wood and the bowstring of five-ply sennit braid. For ornamentation a piece of the braid was sometimes wound spirally around the bow. The bow string is called *fu'a* which also means the strand of a rope. A groove was cut transversely around part of the ends to give a grip to the bowstring. (See Plate XLVIII, *C*, 1.)

The arrows. The arrows are termed *u* or *u fanafana* from the name of the *u* cane of which the shafts are made. The shafts seem long for the bow, being 4 feet long in the general type of arrow and 3 feet in a short type made for a specific purpose. The cane is thin, being 0.3 inches in diameter at the tail end and increasing slightly towards the head end. The end that fits against the bowstring is cut off level at a node and is not feathered.

The arrow points are made of a hard wood, such as *pau* or *olioli* and are attached singly or in twos or threes. The wood is rounded to about 0.2 inches diameter but from 6 inches to the point it is left square in section. This is tapered off to a four-sided point and small nicks are cut on the four edges. In the single pointed arrow (Pl. XLVIII, *C*, 2) a long strip is removed from the shaft back to a node and the near end of the point let into the natural hollow of the cane. Sennit braid is used for the lashing in close turns with the end turned back under three or four loose turns which are then drawn taut in turn and the end pulled to remove the slack.

In the two-pointed arrow (Pl. XLVIII, *C*, 3) no longitudinal strip is removed from the shaft but a point is laid on either side and then lashed. The three-pointed arrow (Pl. XLVIII, 4) is dealt with similarly by spacing them evenly around the shaft end and lashing. The three points are shorter than the others. The ends diverge so that the actual points are separated from each other. The long arrows receive names from the number of points as, *u mata tasi* (1), *u mata lua* (2), and *u mata tolu* (3).

A short arrow used for shooting birds near a house is fitted with one long point which has a wider, somewhat flattened, serrated part 1.5 inches long at the actual point. (See Plate XLVIII, *C*, 5.) It was lashed with crossing spirals and receives the special name of *u ta'afale*. The sport relies on the knowledge that pigeons frequent the pools left in the beds of rocky streams as the streams dry up. Such a frequented pool is chosen and a convenient perch placed across it close to the water. If there are other small pools at hand, they are covered over so as to force the pigeons to the one hole. A

small bower of green branches is made on the bank close at hand and placed to command the pool and the perch.

The fowler's house (*fangai*) is just big enough for the archer with sufficient room to draw the bowstring back. The smallness of the archer's house is applied as a figure of speech to Manono, according to Pratt (23, p. 121) in the term, " 'O le sauali'i o le Fangai." The term *sauali'i* is a title and *fangai* represents the little island of Manono. In the front facing the pool, the house is closed in except for a small hole on either side of the middle line.

Method. A decoy pigeon may be used to attract wild pigeons to the spot but the sport is more often carried on without them.

The long arrows which would be awkward to manipulate inside the house, are left with their points outside and the shaft end just inside the openings of the front wall.

When, therefore, a pigeon lights on the perch, the archer lifts his bow, lays the end of the arrow on the string and draws his bow. The arrow thus comes to the bow without causing the trouble it would in a narrow house if it were inside.

For a clear shot at a bird on the perch, the archer selects the three-pointed arrow (*u matatolu*) or the double-pointed one. Should, however, a bird alight in the branches of a neighboring tree and sit there undecided as to whether it will alight on the perch or not, the archer is tempted to shoot at it without waiting. As it sits in the tree branches, both the double and three-pointed arrows are not desirable as they are more likely to catch on a branch. He, therefore, selects the long arrow with a single point (*u mata tasi*). Hence the saying,

Au mai le u matatasi e fana a'i le lupe ua i le filifili.	Pass me the arrow with a single point to shoot at the pigeon which is undecided.

The moral is to get busy before the other person has had time to make up his mind. To use the long, single-pointed arrow, the bird must be in a favorable position for the use of the bow. Sometimes, however, a bird perches somewhere near at hand where the long arrow cannot be used owing to the cramped position of the archer. It may be above him or to the side. It is then that the short arrow (*u ta'afale*) is used. It can be used from within the house should the bird be in an unfavorable position. The short arrow is thus likened to a person who can deal with difficulties: "Ua se u ta'afale" (Like the short arrow).

If luck were against the archer, he remained in the *fangai* all day without getting a shot. The head of the three-pointed arrow remained outside exposed to the sun. In the evening he returned home leaving the arrows and bow which were wet by the dew during the night. It he were again unsuccessful

the next day the condition was summed up as a saying used in apologizing to a visitor for a lack of food or presents with which to entertain him. The host referred to his poverty in metaphorical language as follows:

Ua sautia le u, 'ua laina le aumatatao.	The shaft of the arrow has been wet by the dew, the pointed head has been shone upon by the sun.

In other words, with no opportunity of using the bow, he therefore had nothing to offer.

Remarks. The bow and arrow were mainly used for the pigeon (*lupe*) but, on occasion, for wild fowls, the rail, and the flying fox. The rail (*ve'a*) has been mentioned in a proverb quoted by Schultz (28, p. 125):

Pa i fale ve'a.	The space of the *ve'a* house.

Schultz explains that the archers shot at the rail from specially built shelters placed closely together so that the archers could whisper to one another, as the rails were very shy. The Samoan talking chiefs consulted did not happen to know the saying but they said the *ve'a* was not sought after for food as were the pigeons, wild fowls, and flying foxes.

Enough has been said to show that the bow and arrow had their most important use in fowling. Shooting fish was less important. No information was obtained as to whether shooting as a mark or for distance entered into any game. The lack of a saying indicating this would intimate that it was not. Its use as a weapon of war was emphatically denied. Roogevein (27), the Dutch explorer who was the first to see the island of Tau from outside the reef, but who did not land, however, stated that the natives had bows and arrows, implying that they were armed with them as weapons of war. Two other statements made from the same distant observation post, referring to their wearing straw hats, and there being a white woman with fair hair on a chief's canoe, show Roogevein jumped to conclusions. The white of lime on the hair and the bleached hair of a *tuinga* headdress worn by a chief's taupou, were sufficient to create straw hats and a white woman. The bows may, therefore, be interpreted into orator's and chief staffs or even spears, while the arrows were imagined.

PIGEON NETTING

A net attached to a handle and termed *'upenga seu* was used to catch the pigeon (*lupe*). Decoys were used to draw the wild birds within reach of the concealed fowler who by a dexterous sweep (*seu lupe*) of the handle caught the bird in the folds of a bag net attached by a frame to the handle.

The following information was mostly obtained from the chief Etau of Aapo, an inland village of Savaii. He gave me one of three nets left by his

father who was an expert and who had instructed him in his youth. In the inland villages, the people naturally concentrated on the foods provided by the forest as their shore dwelling kinsman did on the foods of the sea. It was thus in the inland villages, which are comparatively few, that the sport which was a practical one to them, survived longest after the introduction of firearms. Very few of the older men now living on the coast have ever used the *seu* net but they constantly use the language of fowling in a metaphorical sense with little actual knowledge of the fowling method from which it sprung.

The pigeon of Samoa is still to be heard constantly in the forest as its natural habitat remains undisturbed by the woodfeller clearing a farm in the wilderness. A large assortment of trees provide berries such as thc *manaui, talie, 'asi, tavai, 'au'auli, anume, puapua, taputo'i, pipi, aoa, aumanongi, manulenga, ma'ali, malili, musoi, mati,* and *mameloa*. Where there were plenty of berries, there were plenty of birds. Each crop brought in its own brood as the Samoans say, " 'O le fuanga ma le foanga" (The crop and its brood).

Decoy pigeons. Young birds taken from a nest were more easily taught as decoys, but sometimes older birds caught with the net were kept for training. Captured birds were scratched (*fafai*) over the eyes with the claws of another pigeon. The birds were kept in a cage and also allowed out with a two branched cord attached to the legs (*tauvae*). A perch termed a *tula* consisting of an upright with a bend or a branch was provided for them. They were taught to sit on the branch and coo to attract other birds. They wcre also taught to respond to the pulls of the cord on the legs, to fly straight up or to either side in response to a movement of a stick on which they sat and come down again on the perch in response to a pull on the string. They were pets as well as decoys and chiefs tended them with affection. Their diet was carefully attended to, cooked *talo* or breadfruit chewed (*mama*) and rolled into pellets (*mama lupe*) the size of the usual berries.

A Savaiian story of the origin of the *pula'au* kind of *talo* brings out the importance attached to feeding the decoys.

The chief Pulu-seu of Faasaleleanga on going out netting in the morning told his wife Sina-vai-o-le-malama to chew some *mama lupe* food for his decoys against his return. Sina had only one cooked *talo* in the house and while eating it forgot to leave some pellets for the birds. The omission was serious enough to cause Sina to run away from home rather than face the consequences. At Nofoa, she was assailed by labor pains and lay down under a tree by the wayside. Overcome by pain she called out to the chief Mani-laulau, who was passing, for assistance. He duly tended her and she was successfully delivered of—a *mama lupe* pellet of chewed *talo*. The pellet was buried and grew up into the *pula-au* variety of *talo*.

The myth mechanism of punishing a sin in a form that directs attention to the particular error is a natural process of thought in Polynesia but my informants failed to tell me what kind of *talo* it was that led to Sina's desertion of her home.

The morning feed was given at about 8 A. M. and the time was called *fanga i lupe le la.* The phrase has something to do with the sun waiting for the pigeons. Children who sleep in in the morning are aroused with the cry, " 'Ua fanga i lupe le la."

A chief preferred to have more than one decoy. They were called as in the case of decoy doves, *manu fonua* in distinction to *manu vao,* the wild bush pigeon.

Netting platforms (*tia seu lupe*). A good place was selected in the forest usually on the ridge of a spur where the flown decoys could be seen. A space was then cleared and levelled to form the platform (*tia*) on which the fowling houses to conceal the fowlers could be erected. Ridges that had an upward slope had to be cut down at one end and the spoil used to build up the other end. Unworked stone was used to build up the sides of the earthwork. One was seen near Leone. Some to be more readily seen by the wild pigeons were built up all around with stone to make a raised platform. One near Aopo was on the flat lava in a natural glade between the larger trees. The *tia* were built in localities much frequented by birds. They received proper names and some become famous in local annals.

Fowling houses (*fale seu*). The *tia* remained for all time but the fowling houses were freshly built each season. The houses were merely a shelter of green vines to conceal the fowlers but they received names according to position on the platform. A fully equipped ground *tia* had four houses set as follows: towards the descending slope end was the *fale mua* (first house) also termed the *fale va-ai* (lookout house). At the uphill end was the *fale matua* (principal house), or simply *matua.* To the left side looking downhill was the *falelele* (flying house) and on the right the *palalau.* Between these houses was the central clear space that allowed a sweep of the net from any of the houses near which the pigeon flew.

The houses in Aopo district were made of the *laua* vine which is very leafy and thick enough to provide wooden framework and leafy cover in one.

A length of vine was curved in an arch longitudinally towards the center of the platform, with the ends stuck about 4 feet apart and the top of the arch higher than the head of the fowler sitting on a low seat. Another arch was similarly made about 2 feet from the other. A third transverse arch was laid transversely over the middle of the other two and the ends brought vertically down to the ground. One or two more turns might be taken to add to the main framework but the half in front of the middle transverse arch was not covered above. This was to allow the fowler to rise quickly to his feet to make his sweep with the net. The sides and back of the house were also covered with the leaves of a large bush fern called *aulauta.* The sticks for building the *fale seu* were termed *aufale.* The house described was 4 feet by 2 feet ground plan. A round house was formed by placing the middle transverse arch under the two longitudinal ones and spreading out its ends before insertion into the ground. The main principle of the fowling house was to give as much concealment as possible from the sides and the back but to have the front part of the roof open so that the fowler could

stand up instantly. Across the front a low crossbar was tied to the lower ends of the arches.

The netting seat (*nofoanga*). The house is incomplete without a seat made of a solid section of a tree and about one foot high. The Samoan in ordinary life sits on the ground cross-legged and finds no necessity for raised seats. In fowling, however, a seat was used to enable the fowler to assume the erect position as quickly as possible. The seat was used for quick rising and not for the ordinary purpose of rest. Well-made seats of dubbed-out timber, fitted with legs were also made and indicate the importance with which the sport was regarded. A *nofoanga,* in the Dominion Museum, Wellington, New Zealand, obtained from Savaii, has three legs lashed to projecting lugs on the under side of a neatly shaped seat. The workmanship is good and the technique is shown in figure 295.

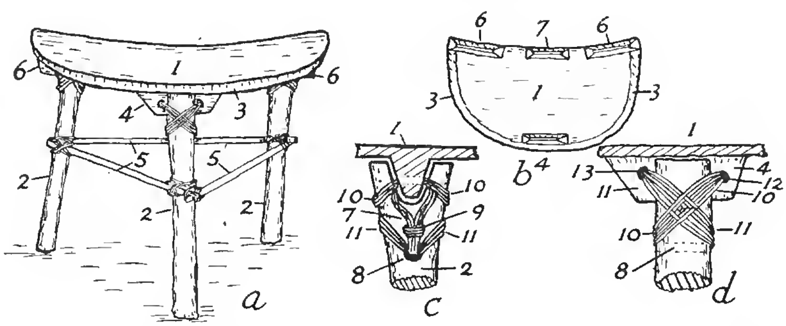


FIGURE 295.—Pigeon netting seat (*nofoanga seu lupe*) with three legs: *a*, general view; the seat (1) is 1 foot 9 inches in width and 11.5 inches from front to back in the middle line; the side and front edges form one continuous convex line with a thick rim (3) 0.9 inch deep, projecting downwards; the back edge is slightly concave. Three legs (2) are lashed to lugs projecting from the under surface of the seat, of which the front lug (4) can be seen. The legs are strutted with 3 crossbars (5) lashed to each leg with transverse and diagonal turns of sennit braid. The height of the seat is 1 foot 4.5 inches. *b*, Under surface of the seat, showing antero-lateral rim (3) and 4 lugs. The lugs are cut out of the solid wood with the seat. One lug (4) is in front in the middle line, internal to the rim (3), with its long axis in the width of the seat. Three lugs are at the back, one in each corner (6, 6) and one in the middle (7), with their long axis in the width of the seat. The front and corner lugs are 6 inches or more in width; about 1.5 inches thick at their junction with seat and narrowed to about 0.9 in thickness at their lower free edges, while their depth is 1.5 inches. The three lugs (4, 6, 6) have 2 holes bored through about 2 inches apart. The thickness of the seat is about 0.75 inch to the inner side of the marginal rim. *c*, Right lateral view of front leg lashing. The section of the seat (1) shows the downward projection of the front lug with the right hole through it in dotted line. The front leg (2) has the upper end expanded to an antero-posterior diameter of 2.4 inches and a lateral groove is cut in it to fit against the lug of the seat. Well below the bottom of the groove, a hole (8) is bored through from side to side. The lashing turns (7) are passed through the lug hole on one side, through the leg hole (8) and up through the lug hole on the other side. The braid returns through the leg hole to again pass through the lug hole of that side. After sufficient turns are made, some transverse turns (9) taken around the side lashings of

either side and oblique turns (10, 11) are made over the front and back of the leg. *d,* Front view of front leg lashing. After passing through the leg hole to the left, diagonal upward turns (10) are made over the front of the leg to the lug hole (12) on the right; downward diagonal turns are made on the back and through the leg hole (8) from left to right; from the right, diagonal turns (11) cross upwards to the lug hole (13) on the left. The first two turns cross in the middle, and the subsequent turns above and below the first crossing result in the simple lozenge design being made on the front and back of the leg. The legs are 1 foot 4 inches in length; the lateral diameter at the upper end is 1.6 inches, less than the antero-posterior diameter which has to provide for a groove. The diameter in the middle is 1.5 inches and at the lower end, the antero-posterior diameter is 1.8 inches and the lateral diameter 1.6 inches. The other legs are lashed in the same way as the front leg.

The fowling net (*'upenga seu*). Kramer, (18, vol. 2, p. 332) figures a net with a short oval frame attached to a long handle with a crossbar near the handle end of the frame, much after the style of one of the nets figured by Demandt (9, p. 46) for catching mullet as they leap over a seine net. Pritchard (24, p. 162) speaks of a bamboo handle 30 or 40 feet long with a net bag attached to its small end. If this type of net was actually used in fowling, it is much inferior to the type of net used at Aopo and figured in Plate XLIX, *A*. This is one of Etau's nets left him by his father and it has been in actual use. The handle was also old but had been trimmed up and restained with charcoal and water.

The net (*'upenga*) is long and narrow. The frame (*'a'au*) consists of two rods of tough pliant *asi* wood sharpened at the lower ends for insertion into the handle sockets. At the proximal end, the meshes are collected into three groups and the cords carried downwards for lashing to the handle.

The handle (*na'a*) made of *fau* is only 5 feet, 2.5 inches long with a diameter of 2 inches at the proximal end. It expands to a width of 4.5 inches at the upper end where a slot 2 inches deep is cut in to form a fork.

The lower end of the net is drawn down and the free cords at this end tied around the cross lashing between the prongs of the handle.

The free ends of the cords at the upper ends of the net are tied to the ends of the rods on either side and one cord is brought across to tie to the other rod end so that the ends are kept at 6 inches apart.

The net as thus set up on the frame is 9 feet 5 inches long, 6 inches wide at the top, 27 inches wide at the widest part and narrows down to 7 inches at the handle. The net has a bag of 30 inches at the upper end, but the middle and lower parts are quite shallow.

The side lines of the net are gathered up with one hand at regular intervals of three meshes. The thin top ends of the rods of the frame are pushed through the gathered third meshes. The other side is similarly treated and the net sides spread down along the rods. The characteristics of the net are the shortness of the handle and the length of the net. The total length of the net and the handle is 15 feet. The method of lashing the pigeon net to the handle is shown in figure 296.

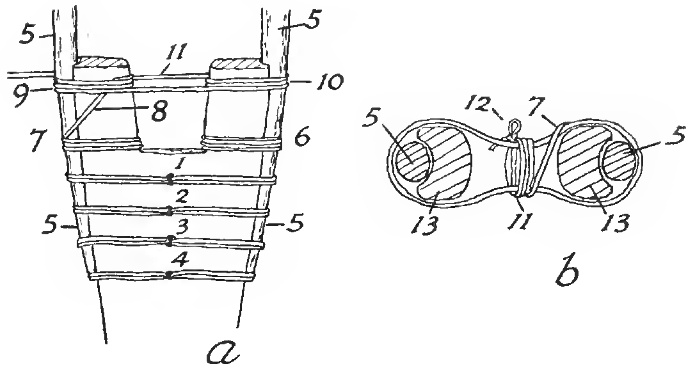


FIGURE 296.—Lashing pigeon net to handle: *a*, the handle has four holes (1-4) bored through in the middle line, the lowest (4) being 2.75 inches from the bottom of the fork. Through these holes, two to three turns of sennit braid are passed and form transverse bands around the handle. The sides of the handle are grooved as far down as the lowest sennit band (4). The bands form loops over the side grooves to assist in keeping the rods of the frame (5) in position. Similar bands of sennit but with more turns are tied around the limbs of the forks (6 and 7). From the lashing at 7, the braid is left long to make the upper lashings around the ends of the limbs. The sennit braid (8) from the lashing (7) at the base of the prong is now carried up and wound three times around the upper end of the left prong (9). It is then carried across to the right prong and makes three more turns around its upper end (10). It is carried back to the left prong from the back (11) and after making three more turns around it, it passes across to the right prong to repeat the procedure. In making the lashings around the upper ends of the prongs, the frame rods are further secured to the handle. The cross turns between the prongs are made on either side front and back so as to provide a set of transverse turns crossing the notch between the prongs. *b*, Section through prongs of handle. The sennit braid (7) is now carried around the transverse turns at 11 and by drawing them together, tightens up the top lashings. When sufficiently taut the braid is tied at 12. The cross section shows the rods (5) resting against the groove on the outer side of the prongs (13).

The eye shade (*taumata*). Before the fowler can take his seat in the fowling house he has to screen his head which is uncovered by the absence of the roof in the front part. An ordinary eye shade of coconut leaflets (*taumata*) is made. (See figure 124.) Some green leaves of the *aulata* fern are laid longitudinally over the head and then tied on with a circumferential strip of *fau* bast. This conceals the hair. The eye shade is then placed over the head and conceals the eyes. Some *aulata* may be run through the shade as well.

Two forms of netting are used; one from a platform on the ground as described (*seu lalo*), and the other from a platform made in a tree.

Ground netting (*seu lalo*) was best in the early morning. The birds of that period were called *to'anga o le taeao*. Fowlers arriving late on the *tia* missed the early birds. Hence the saying applied to anyone who is late for meals or the ceremonial speeches: " 'Ua a sau 'ua te'a le to'anga o le taeao" (You have arrived when the early morning flock has gone).

The fowler took his decoys with him. The *tula* bent stick perch was stuck in the ground to one side of the house entrance. A stationary decoy was placed on the perch to attract wild pigeons towards it that had been attracted within sight. A flying decoy with a long cord attached to its legs was taken inside the house. It obeyed signals made by pulling the cord, or moving the perch. The signalling by movement was called *tafili* and hence the particular decoy was named *manu tafili*. A special perch was provided for it consisting of a rod about 3 feet long with a hole bored in each end. The near end to the fowler was tied with a short length of sennit braid to an upright of the house. To the far hole was tied the end of the long *tauvae* string attached to the bird. The perch rested on the ground and the front crossbar of the house.

Having arranged the two decoys, the net was laid on the ground outside with the end towards the center and the handle resting on the crossbar of the house. The fowler duly comouflaged with the eye shade and fern leaves, sat down on the seat ready to pick up the net handle and spring to his feet. This stage is referred to in the saying, Fale seu o lo'o ainga," or "Ainga le fale seu" (The fowling house is occupied).

The fowler then flew his decoy. He did so by holding the near end of the movable perch and by moving it to the right, left or upwards, he indicated by the actual movement itself the direction he wished the decoy to fly. The pigeon flew in the direction indicated by the movement of the perch. A well-trained pigeon would obey the slightest move conveyed in this manner. Wild pigeons which alight out of reach of the net must be attracted by the fluttering decoy, but care was necessary lest any obvious movement of the perch startle it away. Hence, when a speaker wishes to show that some concealed motive of a previous speaker is known to him, he uses the saying, " 'Ua 'atangia tanga tafili" (The movement of the decoy is seen).

Sometimes the long cord (*fau*) became tangled as the decoy flew about. A saying is used to denote an assembly who are not working together but are confused in their plans: " 'Ua numi le fau" (The line is tangled).

By flying about on the end of the string, the decoy attracted wild pigeons to the platform. As they flew over the open space they also saw the stationary decoy and came down into its vicinity. The fowler who could judge direction of flight, as a pigeon approached within range, picked up the net handle and rising to his feet, swept the net through the air (*seu*) to intercept it.

When a pigeon alighted out of distance, the fowler studied it. He noted the direction in which it was facing, for in starting its flight it must go in that direction. Also, a pigeon in starting its flight always swoops slightly downwards before it rises. The fowler studied just whereabouts the line of its first flight would be. He then startled it with a hissing sound and as the pigeon

commenced its flight he met it with the net as already planned, with an upward sweep to meet the first downward flight. If missed in the upward sweep, a quick man carried the net around in a backward sweep as he spun around on his feet. He sometimes secured it on the back stroke. The various sweeps with the net receive names such as *langatila,* with the net held straight up like a mast, *fa'aifo,* a down sweep, and *fa'aifo i tualima,* a back-handed sweep.

The captured birds were not necessarily killed at once. They were put in an *ola* basket or in a small covered stone enclosure (*fale lupe*) near at hand. The birds which were to be eaten had the long feathers of the wings and tail plucked (*futi opa*) while the ones to be kept for training as decoys were not plucked.

When two were netting in the ordinary way and both had been successful, it was the correct thing for the second fowler to say, "Fa'afetai, mau lupe oe, mau lupe a'u" (Thanks be! You have got a pigeon, I have got a pigeon).

The fowlers rested at a camping place a little away from the platform where they had their food. The place was called a *malolonga* (resting place). A little distance away from the *tia* seen on the ridge near Leone, we found the *malolonga* marked by the oven site and cooking stones.

Tree netting (*seu-a-lunga*) was an individual pastime as only a small platform could be built in the tree from which but only one person had sufficient space to sweep a net.

A good-sized tree, usually *tavai* or *manaui,* was selected and a platform of branches also called *tia* was made in it. The tree in which his father had had his *tia* was shown to me by Etau. He in his turn would have maintained the platform in the same tree but for the advent of guns.

Ladders (*ala 'i le tia*). The trees used had the lowest branches high above the ground so a ladder or way (*ala*) had to be built "to the platform" (*'i le tia*).

Two poles a little apart were tied in an upright position against the tree trunk. One pole was tied, the rope carried across to the other pole and tied, and then encircled around the tree back to the first pole to which it was tied again. The fowler then worked up the poles, attaching wooden rungs between the poles and every here and there carrying a turn around the tree trunk. Fresh poles were joined on and rungs added until the branches were reached.

The tree platform with the house was called *tia seu a lunga* or *fongatia.* A suitable place was selected where natural branches if possible formed cross beams.

Timber was hoisted up with ropes and cross pieces tied in position to form the platform or *pae.* On this one fowling house about 2 feet wide was made in the same way as on the ground except that the ends of the arches were lashed to the cross beams instead of being stuck in the ground. This was covered with green leaves. When dry the thatch was said to be *ua afu le lau fale,* and the thatch had to be renewed to match its surround-

ings. Some of the branches were cleared to get a sweep with the net and a particular branch in a good position was selected against which to lean the net. The net was leant in an upward slanting position. The selected branch was called *aupale*.

Platforms were often in neighboring trees. Though the tree tops were close together, the way between was long as one had to descend the *ala* ladder, walk across the ground to the other tree and then ascend the *ala*. Things which appear close are often far apart in reality and the tree platforms were thus used in a saying applying to such conditions:

'Ua pipi'i tia 'ae mamao ala.	The tree platforms are close but the way between is long.

Method. One flying decoy was used as in ground netting. Two stationary decoys might be used. They were tied to the branches above on the *aupale*. The flying decoy was sent upwards and flew high above the tree top. It attracted birds towards the tree and as their wings were heard, the decoy was drawn down. As the wild birds flew above the tree, they saw the stationary birds sitting on the *aupale* branch. To fly towards them, they had to cross the clear space and here they were met by the sweep of the net which came forward from the *aupale* branch to meet them.

When wild birds were plentiful they kept coming above the *tia* and the expression applies to abundance of anything: " 'Ua malu maunu le fongatia" or, " 'Ua lavalava le fongatia" (The tree platform is full of birds).

On the other hand when no birds were about, no sound of wild wings broke the silence. The condition is applied to times of dearth: " 'Ua lilingo le fongatia" (The tree platform is still).

Other birds such as *fuia* alighting on the tree near the platform, were regarded as common (*vale*) or undesirable and no notice is taken of them. A speaker whose rank or status may not be quite up to the standard of those privileged to speak before an assembly, may excuse himself with the saying: " 'O le a sosopo le manu vale i le fongatia" (A common bird is about to alight on the tree platform).

Phases of the moon. Pratt (23, p. 177) gives the following words for pigeons caught at different phases of the moon:

Lupeo'atoa.	Pigeons caught at full moon.
Lupeofanoloa.	Pigeons caught at no moon.
Lupeomanu.	Pigeons caught at waning moon.
Lupeopupula.	Pigeons caught at increasing moon.

It will be noted that similar terms were used in connection with bonito. The experts of Aopo, Savaii, maintain that the terms apply only to bonito and are never used in connection with pigeons.

Remarks. The tree method of netting pigeons had the advantage of being conducted at the natural level at which pigeons move about. It was easier to attract them into the tree top than onto the ground. On the other hand, there was less room for sweeping the net and the space admitting of but one fowler, the competition and greater fun of the ground method was absent.

Birds from different forests will come together to a common forest where particular berries are especially plentiful. Their unity is short lived for as the cause which united them is disposed of, they return to their different habitats. The Samoan philosophizing on the transient nature of the unity which has brought people of different districts together compares it to the berry seeking pigeons.

'Ua fuifui fa'atasi 'ae vao eseese.	They have flocked together as one but they belong to different forests.

TERN NETTING

The tern (*ngongo*) was caught in a net similar to the pigeon net on the edges of the high cliffs along the south coast of Savaii and the method of netting was termed *seu ngongo*.

Decoys. Trained decoy terns were used. The Samata people held that only white ones were used. Schultz (28) in quoting the saying, "Tavai manu uli," says that black decoys were used as well. They did not have the status of the white birds owing to their defeat by the *funga* fish in the battle of the birds with the fish. The decoys were given the fluid from drinking coconuts but if there was a shortage of nuts, the white bird was given coconut and the black bird ordinary water.

Method. The fowler sat naked without an eyeshade in a clear space near the cliff edge with his net on the ground before him. The decoy (*maunu*) had a string about two fathoms long tied to its leg and it flew about to attract the tern. As the tern came up over the cliff edge, the fowler caught it with his net.

When the tern is caught, it cries out "A." In the discussions of men, talk must be indulged in first before a decision is arrived at. Metaphorically, when a decision has been reached, the *ngongo* is caught and cries out "A." Hence the saying, " 'Ua fafunga le A pei o le faiva o seu ngongo" (The A has been arrived at as in the sport of netting tern.)

FOOD, SPORT, AND SOCIAL INFLUENCE

Food. The Samoan in his quest for flesh food as an *ina'i* complement to the carbohydrate basis of his diet obtained little assistance from hunting in a country devoid of native wild animals. Rats, which had an appreciable value in the diet of New Zealand and Mangaia, were evidently trapped to remove a

pest and had no economic value. Wild pigs were those that had escaped from captivity into the interior and were probably never numerous enough to provide more than an odd windfall for the occasional person who set a trap. The flying fox gave good results to the methods of hooking and netting. Owing to the greater wealth of wild bird life, fowling methods had an important economic value. The snares may be set aside as an amusement, except the manipulated snare for taking young seabirds which, however, was restricted to a favored locality. Fowl traps in most cases were used in the cultivations usually to catch the fowler's own property. The dove and the pigeon, plentiful throughout all the islands, were of sufficient economic value to institute organized effort in the creation of ground and tree platforms and special fowlers' shelters. The bow and arrow, abandoned in warfare, survived in fowling. Technical experts obeying the urge for a change of flesh diet adapted the twined fish trap and the net to the need of procuring food on land. It is interesting to note how the food procuring activities of fishing and fowling seem to have reacted on each other. Fowling provided the fishermen with the bow and arrow as a method of procuring fish. The fisherman on the other hand seems to have given the fowler the idea that the open *tu'u'u* trap with a live decoy might be employed for catching the wild dove. Both the *tu'u'u* fish and the dove are aggressive towards a live decoy of their own species. The fowler made a larger trap of the same material and by the same technique. He placed a decoy within and hiding close at hand, he placed his hand over the open mouth of the trap after the wild dove had entered. He thus followed in every detail the methods observed within the lagoon. The use of the fisherman's hand net to intercept the leaping mullet in the air was also adapted as a method of catching pigeons and both are included under the term *seu*.

Sport. Though fowling was primarily carried out through economic motives, certain psychological factors came into play. The skilled fowler was not only an economic asset to his family but by virtue of his success, he was a social asset as well. His skill created a reputation and led to emulation on the part of others. Thus competition took place to secure the reputation of being the best fowler in the village or district. The villages became interested in the success of their particular champions and pigeon netting progressed beyond a purely economic process to become a sport in which the glory of victory over others became the main incentive. The chiefs stepped in and pigeon netting became monopolized by those of high rank. Chiefs could command the organizing of labor to build the earth platforms faced with stone. They had the leisure and time to carefully train decoy birds. They could pay skilled craftsmen to make the best nets. By increasing the size of ground platform, as many as four men could compete together. They could thus compete for the one bird which they all saw approaching. This element

was absent from all other methods of fishing, trapping or netting and hence gave a greater incentive and reputation to pigeon netting.

Competitions. Competitions were held between two chiefs or two pairs. The two end fowling houses were occupied in a single competition, and in a foursome the lesser skilled partner occupied the side house on the right of his principal. The competition was for the first bird caught or a number agreed on, usually two. In a competition for the first bird, a competitor might throw (*velo*) his net at a bird out of reach in the hope of securing it before an opponent got a more favorable sweep at it.

Chiefs often travelled to another island to meet an opponent worthy of his net. Some competitions have been made the subject of song such as the historic meeting between Fao of Upolu and Ulumu of Savaii. The trial was held on the netting platform of Ulumu.

Ulumu speaks:

Fao e—'Ua e maliu mai,	Oh Fao, you have arrived,
Pe mua 'ai, pe mua fetalai,	Will you eat first or will you talk,
Pe mua le faiva na e sau ai?	Or will you commence with the sport for which you came?
Le fale mua lena e le seu ai,	The chief fowling house awaits you,
A'u seu i le fale va'ai.	I will net from the watch house.

Fao, assisted by a well-trained decoy, won the contest.

Fao speaks:

Ulumu e—Sami maia la'u lupe.	Oh Ulumu, celebrate the victory of my decoy.
'Ua ou mua. Ou fia alu i o'u fonua.	I have won. I wish to return to my land.
Tutuila ua tufi to'elau.	Tutuila has been brushed clear by the trades.
Fao le maunga o Atua.	Fao is a mountain of Atua.
Mua ia ina mua—mua o.	Victory if it is victory—victory.

Ulumu, true to the best traditions of sport, replies:

Fao e—'ua fa'afetai.	Oh Fao, I thank you.
'Ua seu na langatila,	You have netted with the forward upward sweep,
'Ua fa'aifo i tualima,	You have used the backward downward stroke,
'Ua malie na fai o le faiva.	Your exposition of the sport has been good.

Social influence. The elevation of netting to a sport monopolized by chiefs is illustrated by two oft quoted sayings attributed to Laauli, a half-brother of Malietoa-fua-o-le-toelau. On returning from netting tern Laauli found that his brother Malietoa had departed to pay a visit to another village. He followed without bathing or dressing in accordance with his rank. At the next village, he asked some girls whether they had seen the travelling party. The girls, noticing his untidy appearance, somewhat disparagingly asked,

"Why are you so dirty (*lafulafu*)"? Laauli replied, "Lafulafu a tama seu ngongo" (The untidiness of a man who has been netting tern). The girls remarked that his hair was sparse and thin (*valavala*). Laauli again replied, "Valavala a tu manu" (Sparse and thin like the birds). As the sport of netting could be indulged in by high chiefs alone, Laauli indicated by his replies that his dirty and untidy appearance was due to his exercising a privilege pertaining to his exalted rank. The sayings are used to indicate that people should not be judged by outward appearance.

The association of high social status with pigeon netting has reacted on technique in providing the long neat net used and the lashed seat used in the fowling house. The netting seat appears to be the only made seat used by the Samoans and while a section of tree trunk was quite sufficient for ordinary purposes, the neat seat with legs lashed to projecting lugs with a decorative design probably required the incentive of high social status to call it into being.

The competitions in which high chiefs were the participators, led to the full resources of village social organization being called upon. Visitors of distinction had to be suitably entertained by feasting and dancing. Churchward (8, pp. 139-141) states that the pigeon netting season was a time of feasting and junketing and that the entire population took to the bush. Such feasting took place away from the netting platform at the *malolonga* camp. The chiefs carried on the sport while their people prepared the entertainment for them for the intervals between netting. Polynesians are never happier than when they are feasting and dancing. Pigeon netting by providing a cause for such gatherings must therefore rank high as a social institution and its purely economic status occupies a secondary place.

The social influence of the sport is reflected by the large number of sayings derived from it. Both sayings and phrases used in connection with pigeon netting and archery became incorporated in the classical language used by orators. No other phase of Samoan life has contributed so much to enriching the language used by scholars. It is interesting that fowling should have had a similar effect on two languages widely separated for what falconry was to the language of the Court in England in Norman times so was pigeon netting to the language of the high chiefs and orators of old Samoa.

HORTICULTURE

General features. Samoan horticulture is not very intensive. The people grew enough to supply their own needs with something extra to comply with the levy so often made for the entertainment of travellers and guests and special festivals. The tuberous food plants cultivated were the yam,

talo, sweet potato, and arrowroot. The sugar cane, kava, and ti were also cultivated; sugar cane principally for its leaves to furnish the *lau* thatch for houses, the ti to furnish everyday clothing, and kava not only for personal use as a beverage but to supply the *tungase* presentations to visiting chiefs. The paper mulberry for clothing and the *lau'ie, laufala,* and *laupaongo* (kinds of pandanus) for the various mats were also planted. The banana, breadfruit, and coconut also received some attention. The cultivations were made in clearings in the forest inland of the villages and usually on the uplands above sea level. In Olosenga, the cultivations are a considerable distance from the coastal village and long carries have to be made along the narrow zigzag track which connects with the high tablelands. On the smaller areas around the back of the houses, kava, sometimes sugar cane and bananas are planted to supplement supplies. Some pandanus is also grown near the houses. Swamp lands are usually near the villages in the hollow between the rising hills at the back of the village and the rising shelf of the beach in front. Bush clearings are usually small and confined to separate families. In the swampy ground, however, when of some extent, various families share the area which is divided off into plots by drains and paths.

The bush clearings are now readily formed by using the heavy introduced bush knife which performs all sorts of functions from whittling small wedges and cutting up pigs to felling fairly large saplings. It is now the inseparable companion of the man who walks into the forest. Formerly, the bush clearings had to be made with implements of stone. The small scrub and light saplings were ringbarked. The whole was then fired and it mattered not that a large tree remained standing here and there in the clearing.

IMPLEMENTS

The implements used in preparing the ground were the digging and the planting sticks.

The digging stick (*oso*) was of hard heavy wood, between 5 and 6 feet long and about 2 inches in diameter at the thick end which was sharpened. The bark was peeled off and it was devoid of any foot step or ornamentation. It was jabbed into the ground with both hands and the soil loosened by levering up the point. With such a crude implement, only the actual parts where the seed was to be planted were dealt with.

The planting stick termed *oso to* (*to,* to plant) was thicker, with a blunt, rounded point. This was thrust down into the loosened ground and levered from side to side to enlarge the hole. Lack of information as to weeding implements implies that special implements had not been devised.

The cultivation was visited from time to time and the spreading creepers or young growth cleared away. Under normal conditions, the people divided their attention between tending their cultivations and fishing in the sea and

lagoon. Extra activity in war or political agitations always resulted in neglect of the bush cultivations and a subsequent falling off in the vegetable food supplies.

CULTIVABLE FOOD PLANTS

The yam (*ufi, Dioscorea sp.*) formed the first crop in newly prepared cultivations. The plants were grown from seed tubers which were planted close to the trunks of the trees left standing or besides large branches to give the vines support as they spread. The yams are easily damaged by bruising in transport or planting and do not recover from rough handling as the *talo* does. The yam crop was thus uncertain and often failed. Owing to this greater uncertainty and the greater care needed, it is not now grown so extensively as in former times when people were more careful in utilising all their available material. The easily procurable flour and bread has provided a substitute that has led to less activity in certain directions. The spreading vines of the yam are termed *tolo.*

One of the numerous Sina married the king of Fiji. Her brother Pili went to visit her but hid in the bush being evidently doubtful of his brother-in-law. He asked the birds and trees how he could get a meeting with his sister. The *palai* yam offered his services and sent one of his *tolo* vines to Sina's door. As Sina came out, her foot caught in the vine. At that time there was a shortage of food in Fiji so Sina followed along the vine to find the tuber. There she found her brother. The *palai* yam is very long. Sina broke off a piece and returned home. Every day she returned to meet her brother and broke off another piece of yam. (A yam broken off is termed *matanau.*) As she had followed up (*tuli*) the broken-off tuber, the tuber was called *tuli matanau.* Hence repeated attempts at meetings or consultations to effect unity is referred to as, "Tuli matanau, le ufi o Sina" (*Tuli matanau,* the yam of Sina).

Yams are to be seen growing wild in old cultivations. In times of scarcity, they are sought after. The season for planting is June, July, and August.

The talo (*Colocasia antiquorum*) was the staple crop of Samoa. Various kinds are distinguished by names. The following five were enumerated at Tanga, Savaii, but there are many more names known in other parts.

Talo manu'a, from Manua.

Talo niue, from Niue Island.

Talo mangasiva, the best kind used for chiefs.

Talo tanga, a local variety.

Talo pula'au, also a local variety.

The *talo tanga* and *talo pula'au* were the two original *talo* of the district.

The semi-wild *talo, talo pula'au* was given a mythical origin from the chewed pigeon food (*mama lupe*) described under pigeon netting. It is edible but not fit to place before guests. Hence has arisen an apologetic expression for the poorness of the food placed before visiting chiefs:

Talofa, e leai se lelei na o pula'au se mea nei. E le aonga.	Regrets, there is nothing worthy as this is *pula'au*. It has no value.

When dug up, the tops of the *talo* were cut off with the stalks in one piece. The outer wider leaves were removed. This formed the seed (*tiapula*). Following the custom of collecting mats and other articles, people short of planting material visited other villages ceremonially and were supplied.

The *tiapula* were planted in holes (*lua'i*) made with the planting stick which was then called *oso to tiapula*. The hole was always made much larger than the plant. Mr. Judd (17, p. 13) states that the hole was made deep and wide enough to receive two "seeds" which, being planted at the bottom of the hole, were protected from the sun. The hole also collected water from the neighboring plants. In some parts, such as Ngataivai, Savaii, the *tiapula* are planted singly against the side of the hole which is kept patent. The *talo* cultivations are along the banks of a stream which often overflows and fills the holes with silt. Children clear the holes by scooping out the silt with their hands. The idea of the large hole is to allow the tuber to expand laterally. If the holes are not cleaned out, the *talo* grows long and thin.

There are two forms of planting; the dry planting in the bush cultivations, and wet planting (*loiloi*) in swampy lands. The swampy lands are limited in distribution and it may be said that dry planting is the more common form. Fairly extensive wet cultivations were seen at Tau, Olosenga, and Aunuu Island. In all these cultivations the *talo* swamp was formed between the hills and the raised beach. The water accumulation was natural and not due to artificial irrigation. The area was divided off into plots (*fuinu'u*) by cut drains and pathways. The drains (*alavai*) contained stagnant water and had been cut to lower the water surface and not for irrigation which was impossible owing to the one level of the cultivation. The paths had large stones placed in the damper parts as footways.

Mulching was used by not only spreading the cut weeds round the growing *talo,* but by using coconut leaves and even old mats spread over the ground between the *talo.* This, by keeping the sun off the ground, not only kept the ground from getting dry but also restricted the growth of weeds.

Light fences of sticks were run along the sides of the drain and helped to keep the coconut leaves at the edges from slipping down into the drain. Scarecrows were also used.

In some rocky parts, the holes had to be made in between the stones and were necessarily shallow. This condition exists at Asau, Savaii, and finds expression in the saying, "Ua fa'alua'i talo Asau" (Like making the holes for the talo of Asau).

The planting season for the *talo* extends the whole year round. It is usual, when a new cultivation is not contemplated, to cut off the tops as the *talo* are dug up and plant them in the same place.

Wet planting is confined to natural swamps and seepages and the *alavai* are merely drains. The advanced system of irrigating terraces by leading the water down through irrigation ditches from the stream at a higher level is not part of the Samoan agricultural system. No built-up terraces were seen and it was stated that they were not known.

In the new cultivations, the *talo* followed the first or second crop of yams.

The ta'amu species of *talo* is the large form with most of the bulbous part growing above ground, known as *kape* or *'ape* in other parts of Polynesia. It is grown and used as a food which is not restricted to times of drought. The following names were collected: *laufala, lauo'o, usolenga, famai, funga lata, fanga.* The last two are not eaten. Two kinds (*tonga* and *niukini*) were introduced from Tonga and New Guinea.

The sweet potato (*'umala, Ipomoea batatas*) was seen growing at Olosenga in sandy soil just outside the houses in small mounds. They were prolific and of good flavor but only grown because the *talo* crop had failed the previous year.

Arrowroot (*masoa, Tacca pinnatifida*) is cultivated from the stalks of the plant cut off in lengths after the mature root is dug up for use. In Samoa, according to Pratt (23, p. 238) the widespread Polynesian name of *pia* was abandoned because it had another meaning which he characterizes as obscene. The term *masoa* was substituted to satisfy the sentiments of prudery newly acquired from foreign teachers.

Sugar cane (*tolo*) was planted principally to provide leaves for thatch but is also grown for eating purposes near the houses in heaped up mounds called *tapu'e*. Mr. Judd (17, 2, p. 31) collected the following names with their characteristics:

Ula—wide leaves, red skin.

Fatu—narrow leaves, black skin (thatch only).

Uli—broad leaves, black skin.

Limu—broad leaves, green skin.

Vaivai ula—striped light green on red body.

The kava (*'ava, Piper methysticum*) was planted by preference in rocky places around the backs of houses or back in the cultivations. It was planted from the branches (*'ata*) and when the roots were dug up, a branch was always planted to provide for the future. Hence the saying, recommending wise provision at the time of attending to present needs:

E sua le 'ava 'ae to le 'ata (Dig up the kava root but plant the branch).

The ti (*Cordyline terminalis*) was easily grown from small side shoots. They were planted in the neighborhood of the houses and near at hand as the leaves were in constant demand for clothing. It may be owing to its extensive use in furnishing the *titi* kilts that it was not used so much to wrap

food. People soon get into the habit of associating material with particular needs. Thus the ti was for clothing and the banana leaf for food wrappings. The underground stem provided a saccharine chewing material.

TEXTILE PLANTS

The paper mulberry (*u'a, Broussonetia papyrifera*) was extensively cultivated from cuttings by the women folk. On more than one occasion I saw a woman with a bundle of short cuttings, which she was going to plant in the bush cultivation on the following morning. Fresh crops were planted from time to time to keep up the supply. Some may be seen growing near the houses but the large stock is back in the bush usually dotted here and there amongst the other plants of the garden.

Species of pandanus (*laufala, laupaongo, lau'ie*) were planted for mat material, though the wild growing pandanus may be used on occasion. The undergrowth is cut. The old leaves are usually plucked off, and the growing heads may be bound round the base with a strip of leaf.

FRUIT PLANTS

The banana (*fa'i*) is planted as food not only for the ripe fruit but also for cooking. Not much care is taken in selecting good plants or taking care of the cultivation. Holes are made and the plant stuck in to take its chance.

The Samoans divide bananas into the *soa'a* (plantains) and *fa'i.* There are three kinds of *soa'a,* distinguished by the fruit: *soa'a,* smallest and longest; *sulasula,* intermediate in size; *fa'i puta,* large and short.

Of the other bananas, a large number of varieties are recognized as the following list from Leone shows:

NATIVE	RECOGNIZED AS FOREIGN
Fa'i mamae ulu.	Fa'i papalangi (Cavendish)
Fa'i mamae se	Fa'i fuamanalunga
Fa'i samoa	Fa'i fuamalolo
Fa'i latetele	Fa'i faaleongolua
Fa'i usi	Fa'i Tonga
Fa'i pu'a	Fa'i Niue
Fa'i ilimanifi	Fa'i misi luki
Fa'i usi se	
Fa'i malama'a	
Fa'i tapuaota	
Fa'i pipi'o	
Fa'i vavaileta	
Fa'i pulu	
Fa'i pata	
Fa'i toemanu (wild, not eaten)	

The breadfruit (*'ulu, Artocarpus incisa*) grows in the villages and affords shade as well as fruit. It is also grown back in the cultivations. A large number of varieties are named as in the following list by Mr. Judd (17, 2, p. 31):

Puou, round fruit, best house timber.	Ea.
Ma'afala, long fruit.	Fau.
Sangosango, yellowish flesh.	Aveloloa, best for *tafolo*.
Ma'a, long fruit, yellowish flesh.	Tala.
Mase.	Poututono
Manu'a.	Pousina.

The *maopo* has no divisions in the leaves, which are used as plates for foods such as *fa'ausi* and *tafolo*.

There are four seasons (*fuata*). The *fuata* starts with the flowering of the fruit and it is two months before the fruit is properly mature for eating. The approximate months of each season are: 1. Fuata mafu i ato seu (about March); 2. Fuata ta'oto (May). After the westerly winds, the trees which have been blown down, still bear in the prone position as long as a root connection with the ground is maintained. Hence the name of *ta'oto* (lying down) is used. 3. Fuata tu fa'amanu (August). Again after the severe winds, the leaves are blown off the trees and the fruit shows up in the stalks like birds (*tu fa'amanu*). 4. Fuata a le tau (October).

The coconut (*niu, Cocos nucifera*) seems to be planted anywhere regardless of order, distances apart, or elevation from the sea. Many seem to have been taken up on the hillsides to show that someone has had a cultivation in a seemingly inaccessible spot. Many trees have grown up close together from the fallen fruit being allowed to take care of themselves. Carelessness as to progressive planting exists and the people take up the attitude in many instances that the coconuts will take care of themselves. An increasing reluctance to use the climbing bandage has resulted in steps being cut in the trunks to afford toe holds. The trees deteriorate and when a storm takes place, the trees snap off at one of the cut steps. Various names are applied to different kinds of coconuts but a list was not collected.

The trees are all privately owned, but no objection is raised to travellers taking drinking nuts so long as they do not abuse the privilege. Special trees set apart for copra or other purposes are marked with a sign termed a *tapui* to indicate that they are prohibited. Such prohibitions are also made on the trees devoted to assisting the income of the church. When the mature nuts are collected for commercial copra, they are stacked up around stakes to which they are fastened. (See Plate L, *B*.)

Other plants, such as the *maile lau li'i* for wreaths and the *au'u'u* for fish poison, may be planted for use.

SCARECROWS

Scarecrows (*aveau*) were seen in the *talo* cultivation at Aunuu. They consisted of two plaited *maile* (rough food platters) of coconut leaves placed back to back and inserted vertically over the end of sticks stuck upright in various parts. As the wind blew they rotated a little, giving sufficient movement to startle the *manuali'i* (*Porphyrio samoensis*) which frequent the *talo* patches and destroy newly planted *tiapula*.

PROHIBITIONS AND MYTHS

An owner may protect his coconut and breadfruit trees by putting up notices on the trunks. A notice consists of a piece of coconut leaf placed longitudinally against the trunk with the butt upwards and three or four leaflets from either side brought around the tree and tied in a knot. Sometimes the notices are more elaborate and are made with a stake beside the path as a warning to travellers. A mature coconut may be suspended to the trunk of a coconut tree by a strip of the husk torn down from one end. In olden days, some of the *tapui* were rendered virulent by some ritual which caused sickness or death to those interfering with them.

The origin of the coconut *tapui* is attributed to Nafanua who delivered western Savaii from its oppressors and became a war goddess of the district. Turner (41, p. 39) says that the oppressed people were forced to climb the coconut trees feet upwards and pluck the nuts with their toes. Nafanua, who came from Pulotu, took the lead in the battle for freedom. She covered her breasts with coconut leaflets to conceal her sex and her troops wore coconut leaflets round the waist as a distinguishing badge. After the victory, Nafanua tied coconut leaflets round some of the trees to mark them as hers and from that time coconut leaflets have been used as a prohibitory sign.

Samoan tradition abounds with myths concerning the origin of various plants. The *talo,* coconut, and kava according to one, were obtained by Losi from the Tangaloans in the heavens after a struggle in which they were given to him to rid heaven of an unwelcome visitor. The paper mulberry and the pandanus were brought to Samoa by Fulualela, a Fijian chief, as part of his daughter's dowry. Various myths occur in different parts, all bearing witness to the spread of useful plants by human agency.

REMARKS

The comparatively large area of cultivable land in proportion to the population may have been responsible for the absence of intensive cultivation that is evidenced by the irrigation methods of producing *talo* which exist in some parts of Polynesia. If the ancestors of the Samoans were acquainted with irrigation terraces, some practical reason such as lack of necessity must have led to their being abandoned.

Though the horticultural implements were confined to two forms of pointed sticks, the presence of the planting stick (*oso to*) is all important and marks the gap that exists between food gathering and food producing peoples. Its importance was fully appreciated in ancient times for the early ancestor Pili, in dividing land and spheres of influence among his sons, gave the western part of Upolu and the spear to Ana, the middle portion and the fly flap to Sanga, while to the eldest son Tua he gave the eastern part of Upolu and the planting stick. A fourth son Tolufale lived on Manono and was given supervision over all. The material gifts represented war, oratory, and horticulture. To Pili, the planting stick symbolized labor in the production of food. Turner (41, p. 234) quotes him in his last exhortation to his sons as saying, "When you wish to fight, fight; when you wish to work, work; when you wish to talk, talk."

GAMES AND RECREATIONS

TOYS

Toys made of coconut leaflets were made in the same way as at Aitutaki (39, pp. 318-322). These included the windmill (*pe'ape'a*), spinner (*moamoa*), and bull roarer (*lango mumu*). The bull roarer from its humming noise takes the name of the buzzing fly. A primitive Jew's harp of a piece of coconut leaflet midrib held between the teeth and one end played by the finger is seen amongst children. Toy bracelets and leaf canoes are made to play with. Coconut shoes (*vae ipu*) are made by running a strip of bark through the eye of a half coconut shell or a hole knocked through the shell. A ball somewhat square is also made of coconut leaflet with a covering check plait.

SWINGS AND SKIPPING ROPES

Swings (*taupenga*) are used, and a skipping rope (*tafue*).

STILTS

Children were seen using stilts in Tutuila and Savaii but they were made of wood nailed to uprights and no information was obtained as to whether the practice is old.

SLIDING

Sliding (*fa'ase'enga*) without apparatus is indulged in. Rocks worn smooth by streams are used by bathers who slide over a short fall into a pool below. Sliding on the flat is a pastime at Taputimu, Tutuila, where there is a very slippery smooth strip on the rock stratum of the nearby coast. Various figures are indulged in, as sliding sideways, backwards, crouched, jumping over prone figures, and a tug-of-war between parties seated on the slippery rock. Two forms of sliding used an appliance.

Tobogganing. A course was sometimes made on a down slope with pieces of *lapalapa* or coconut leaf midrib laid across the course and set into the ground. Another piece of midrib from the butt end was used as a toboggan. Sitting astride of the curved part, one end was held in the hands and the primitive toboggan coursed down hill over the transverse pieces on the course. Nothing in the way of dubbing a toboggan out of wood was known. No name in particular was given to the sport beyond *fa'ase'enga*.

Surf riding. Surf boards made from the sides of old *paopao* or bonito canoes were used. The length was measured from the finger tips to the breast and cut off. They were used in this position. No elaborate long ones were used, and standing on the board was never attempted as its small size was against such attempts. Surf riding was also known as *fa'ase'enga*.

TOPS

Tops (*moa*) shaped like European whip tops were made. A small coconut was used with the *muli* end sharpened to a point. The top was spun by winding a strip of *fau* bast round it and then jerking it sideways. The *fau* strip was called *'afa* in spite of its not being coconut fibre. The side jerk is termed *se'i*. Sometimes the top is jerked downwards (*tongi*) to strike another. The spinning of the top is *vilivili* and the following refrain is chanted as it is spun.

Vilivili moa moa, vilivili moa moa,	Spin top, spin top,
Aumai lau moa tau ma la'u moa.	Let your top come to fight with my top.
Vilivili moa moa, vilivili moa moa,	Spin top, spin top,
Sau le itu le avenga moa.	The spirit comes with a burden of tops.

Stone was never used for making playing tops though stones shaped exactly like tops were used to form squid lures. Tops were only spun with the bark strip. No whip was used to keep them going.

Teetotums. A game similar to teetotum spinning is described by Turner (41, p. 128). A coconut was spun in the center of a seated circle of players and whoever the three eyes at one end of the coconut pointed to had to pay a forfeit. The forfeit usually consisted of performing some manual task. It was also used as the method of casting lots designating one to accomplish a particular duty, the group was unwilling to undertake voluntarily. It was also used to point out a thief when one of a party was charged with a crime.

JACKSTONES

Jackstones (*sapo*) was played by children, especially girls, with five stones about the size of ordinary marbles. The stones were termed *'ai* which is a general name applied to small articles used in games. The principle of the game was to toss a stone and while it was in the air to execute various movements before catching it in its descent. A large number of figures were gone

through in proper sequence. The player went on from figure to figure until she missed a catch or a movement when the turn passed to the next player. When the turn came back again, the player went on from where she missed in the previous turn. The game could be played by two opponents or two pairs of partners. Sides played alternately and in partners, the second carried on from where her partner missed. In Savaii, there were 26 different figures as follows:

1. Singles. Four stones on the floor and one in the hand. The stone held will be referred to as the hand stone. Toss the hand stone, pick up one stone and catch the hand stone. Transfer a stone to the left hand and repeat with each of the remaining three until all four have been picked up singly.
2. Pairs. Four stones on the ground. Repeat first figure but pick up the ground stones in pairs.
3. One and three. Four stones on ground. Toss hand stone, pick up one, catch. Transfer one to left hand out of the way. Toss hand stone, pick up remaining three ground stones and catch.
4. Striking breast. Four ground stones. Toss hand stone, pick up one, strike breast with right hand, catch. Repeat with the other three stones singly.
5. Four stones. Five stones in hand. Toss one, put down four and catch. Toss hand stone, pick up four ground stones in one movement and catch.
6. Double breast tap. Four stones on ground. Toss hand stone, tap breast twice with right hand, pick up one stone and catch hand stone. Repeat singly with each of other three ground stones.
7. Back hand toss. Five stones in hand. Toss all gently, turn hand quickly and catch three on back of hand. If catch less than three, lose turn. If more than three, drop the extras. The three are tossed from the back of the hand and caught with a forward or downward movement. The usual catch with the hand cupped to receive the falling stone is ruled out. The three stones caught are transferred to left hand except one hand stone. Toss hand stone, pick up one ground stone and catch descending hand stone with forward catch. Transfer one stone and repeat with remaining stone on ground.
8. Changing singly. Four ground stones. Toss hand stone, pick up one, catch. Toss one of two stones in right hand, put down the other, pick up one in its place and catch. Change other three stones singly in same way, finishing with one stone in hand.
9. Holding all. Four ground stones. Toss hand stone, pick up one, catch. Toss one keeping other in palm, pick up another stone, catch. Keep on till all five stones are in the right hand.
10. Touching both knees. Four ground stones. Toss hand stone, touch right and left knees with right hand, pick up one and catch. Transfer one stone to left hand. Repeat with other three singly.
11. Putting down singly. Five stones in right hand. Toss one, put down one, catch. Repeat till four are down singly.
12. Cross catching. One in left hand, four in right. Toss left, put down one with right and catch with right. Transfer one stone from right hand to left and repeat singly until all four stones are down.
13. Repeat figure 5.
14. Double hand scoop. Five in right. Toss one, put down four, catch. Toss, scoop up four with both hands and catch in two hand cup.
15. Striking left palm. Four down. Toss hand stone, pick up one, strike left palm with it, catch. Transfer one to left. Repeat with each of remaining three singly.
16. Double clap. Four down. Toss, clap hands twice, pick up one, catch. Transfer one to left hand. Repeat with other three singly.
17. Upward catch. Five in right, low toss and catch 3 on back of hand as in opening of figure 7. Extras dropped. Toss three from back of hand and catch with an upward

sweep. Discard two to left hand. Toss hand stone, pick up one of two on ground, catch with upward sweep. Transfer one, repeat with remaining ground stone.

18. Three thigh slap. Four down. Toss hand stone, pick up one, slap left thigh with left hand, slap right thigh with right hand, slap left thigh again with left hand, catch. Repeat with other three ground stones singly. The slaps have to be made very quickly.

19. Ground double tap. Five in right. Toss one, tap twice on ground with right hand and leave one stone on ground, catch. Repeat singly till four stones are on the ground.

20. Tapping stones. Four on ground. Toss hand stone, pick up one, tap another stone with it, catch. Repeat singly with next two, and tap ground with last.

21. Double touch. Four stones placed on ground spaced in a square. Toss hand stone, touch ground on either side of one stone with forefinger, catch. Repeat with each of other three.

22. Scraping towards knees. Four down. Toss hand stone, pick up one, catch. Toss one keeping other in right hand, scrape one on ground towards knees, catch. Repeat singly with other two on ground. Toss, put down other stone in hand, catch. Toss, scrape fourth stone in towards knees and catch.

23. Three and one. Four stones down in two groups of three and one. Toss, pick up three, catch. Transfer. Toss, pick up one, catch. This is the reverse of figure 8.

24. Four stone. Repeat figure 5.

25. Three ground taps. Four down. Toss hand stone, tap ground with left palm, then with right palm and again with left, while right hand picks up one, catch. Transfer one. Repeat singly with other three. The secret is to tap with the right hand over a stone and then pick it up in time to catch the hand stone.

26. Double hand beat. Four down. Toss, beat ground with quick double beat, right, left, right, left, pick up one and catch. Repeat singly with other three. Here again beat with the right hand over a stone and pick it up as the left hand is making the second beat.

WATER TIP-CAT

The game *tapalenga* (from *tapale,* to strike) is played in the water between two sides. A short piece of light wood (*uto*) and two sticks (*au tapale* form the equipment.

The water must be shallow enough for the players to stand on the bottom and use the sticks. Two imaginary goal lines (*tingi*) are agreed on. The players hold a stick in each hand while the *uto* has to be struck over the goal line. With the left hand stick, the player strikes the water near the *uto* so as to throw it up in the air on the splash. While the *uto* is in the air, he strikes it with the right hand stick in the direction of the goal. The game is simple, but has two oft quoted sayings connected with it: "Le uto 'ua tingi" (The float has reached the goal). On reaching the goal it is returned, hence: "Taliu le uto" (The float comes back).

When visitors pass through a village on their way to another, the saying is used to invite them to call in on their return.

KITES AND FLYING LEAVES

Kites seem to have been unknown to the Samoans. No names, proverbs, or sayings were known to the talking chiefs consulted. When asked questions about kites they said the children flew candlenut leaves to imitate pigeons while chiefs flew tame piegons on a long string.

Flying leaves. The leaf used is the candlenut leaf (*lau lama*) and the attempt to make it fly like a piegon is *fa'alupe*. The game is thus *fa'alupe lau lama*.

The sides of the leaf are pinched off to make them parallel with the leaf midrib, and the stalk is removed. When a wind is blowing, the leaf is held in the palm of the right hand with the upper surface away from the palm and the stalk end towards the little finger. The thumb and forefinger press in slightly to hold the leaf. The arm is held downwards with the palm upwards. The cast is made by bringing the arm sharply upwards against the wind and letting go the leaf as the back of the hand comes uppermost. The leaf starts off with the stalk end inclined upwards and forwards so that the wind catches it like a kite. The leaf may fly fairly straight, but it usually undulates in waves and darts off to either side as it volplanes along.

Owing to its erratic course, the leaf is often likened to a chief of uncertain mind. His talking chief in remonstrating with him will adjure him not to *fa'alupe lau lama*, or, in other words, not to allow his mind to dart from side to side like a candlenut leaf flown as a pigeon.

Angry women, giving vocal expression to their wrath, often spread out their arms and turn from side to side to add force to their remarks. This action is known as *fa'alupe lau lama*. Spectators beyond hearing, seeing the action, know that the person is so angry that she is "flying a candlenut leaf."

PIGEON FLYING

Tame pigeons used as decoys were also flown (*fa'alelenga lupe*) on a very long cord for recreation. The cord was three-ply sennit braid, but made very thin, so as not to be too heavy for the bird. The coconut husk was not beaten on an anvil but the fibres were separated in layers with a piece of flat pointed wood as in the making of strainers from *laufao*. Beating on an anvil bruises the fibres and renders them weaker. For a thin cord, extra strength was needed. The cord was wound in figure of eight turns on the palm or back of the left hand round the thumb and little finger. The coil was removed, doubled at the crossing, and half hitches made round the doubled end as in the *i'o fanga* method. The inner end of the cord was pulled out and the cord tied round the pigeon's leg.

A piece of the thin bark cloth known as *lauu'a* was rolled round the right forefinger. The coil of cord was held in the left hand and as the pigeon flew, the cord ran out of the coil, and over the right forefinger, which was protected by the wrapping from the friction of the running cord.

The cord was made as long as possible. As it neared the end, the cord was given a couple of tugs as a signal for the trained pigeon to return. The return signal was called *pao*. As the pigeon flew back, the right hand brought back the slack to the left hand in coils.

The old village of Poloa in Tutuila was situated up on a ridge and a certain part is still pointed out as a famous pigeon flying ground. The amusement was essentially one of chiefs as they owned the tame decoys for pigeon netting. They vied with one another to see whose pigeon would fly the greatest distance.

STRING FIGURES

Hornell (16, pp. 71-76) collected six string figures in Samoa during his brief stay at Apia in spite of being assured by Europeans that string figures were unknown to the Samoans. Subsequently I was informed, evidently by the same people, that Hornell had collected some string figures, but that they had been introduced into Samoa by Europeans. As, however, I had already collected a few additional ones in the most remote village of the Manuan group, the statement had no ethnological weight. The European opening of string figures, and the Polynesian opening, are distinctly different from each other. All the Samoan figures collected, except a trick figure, had the orthodox Polynesian opening. That Europeans should teach Samoans the Polynesian methods of making string figures is a paradox that our European informants had evidently not considered, else the theory of European introduction had never been made.

If an excuse for imparting unverified information is to be made, it is in the fact that the Samoans have not retained many figures, though as Hornell found, the few are widely known. Hornell's natural surmise after his success in Apia that further inquiry would be richly repaid has not been realized by me. Nine unrecorded figures were obtained besides three of those recorded by Hornell. Careful inquiries in various villages failed to add to the number. Though there must be other figures, I doubt if there are many. Samoa seems poorer in string figures than other parts of Polynesia, or has forgotten more. The generic name has evidently been forgotten for the game is known as *vaepato* (duck's foot) after the most widely known figure.

Terminology. The terms used follow Rivers and Haddon (26, pp. 146-153) where radial and ulnar refer to the thumb and little finger sides of the hand and distal and proximal to the finger tip and wrist ends respectively.

Position 1 is with the string looped over the thumb and little finger of each hand with the string passing over the palm between them.

Opening *A*, the orthodox Polynesian opening, is made by inserting the index fingers proximally under the palmar strings of the opposite hands and withdrawing them with index loops.

The term *navahoing*, introduced by Haddon and followed by Hornell, Handy, and others, consists of slipping the proximal of two loops over the tips of the fingers holding them.

Duck's feet (*fa'avae pato*). This figure was obtained in three ways, one being like Hornell's (16, p. 72) and the other two slightly different to each other.

FIRST VARIATION

1. Opening *A*.

2. Transfer the thumb loops to the middle fingers, the fingers passing distal to the ulnar string and proximal to the radial.

3. Pass the little fingers distal into the middle finger loops and pick up the radial strings of the little finger loops by passing under them from the ulnar side.

4. Navaho the little fingers, release the index fingers and extend.

The figure was obtained at Fitiuta, Tau, from the girl Poina.

SECOND VARIATION

1. Commencement A with the middle fingers.

2. Transfer the middle finger loop to the thumbs by passing the thumbs proximal under the radial strings of the middle finger loops.

FIGURE 297.—String figure, *vae pato* (duck's feet); variation obtained from a girl, Lila, at Fanganelo, Savaii. In forming commencement (*a*) she took the loop on the middle instead of the index finger.

3. The thumb has now two loops. Transfer the proximal loop to the middle fingers by passing the middle fingers distally over the distal loop and under the radial strings of the proximal loop from the ulnar side. The loops are lifted up over the thumbs and distal loops on the backs of the middle fingers.

4. Pass the little fingers distal into the middle finger loop and pick up its own radial strings by passing under it from the ulnar side.

5. Navaho the little fingers, release the thumbs and extend.

The last two movements are the same as in the previous except for releasing the thumb.

NO NAME

1. Position 1 with the strings crossed.

2. Opening *A*.

3. Movement 2 in previous figure.

4. Movement 3 in previous figure.

This results in three loops from either hand crossed in the middle.

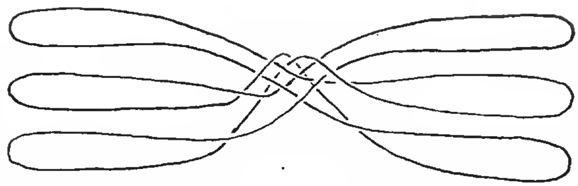


FIGURE 298.—String figure, obtained from girl Lila at Fangamalo who did not know its name.

LAULAU

1. Opening *A*.
2. Drop the thumb loops.
3. Transfer the little finger loops to the index fingers by passing the index fingers into them proximally.

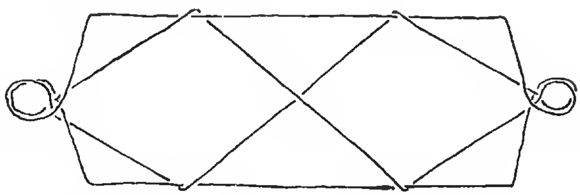


FIGURE 299.—String figure, *laulau* (food platter) obtained at Fitiuta.

4. Pass the thumbs distally over the radial string of the proximal index loop and pick up the ulnar string on their backs.
5. Repeat 4 with the distal index loops.
6. There are two strings on the radial side of the index. Pass the ring fingers distally over the distal string and pick up the proximal string on their backs.
7. Navaho the thumbs.

PILI ME'IME'I

1. Opening *A*.
2. Pick up the ulnar strings of the little finger loop with the backs of the index fingers by passing them distal to the radial strings and proximal to the ulnar strings.
3. Remove the thumb loops with the backs of the index fingers by passing them through it distally and picking up the radial strings from the proximal side.

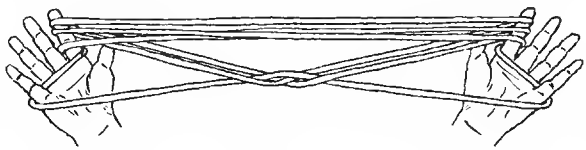


FIGURE 300.—String figure, *pili me'ime'i* (shrinking lizard) obtained at Fitiuta.

4. Rotate the hands downwards so that the index fingers rotate round a transverse axis. In doing so, they pass round the lower strings and bring them up to the top on the radial side of the indices. By continuing the rotation with the indices turned slightly inwards, they pass above the strings. Be careful not to drop the little finger loop.

5. The figure is worked up and down by pressure with the little finger loop.

ATI

1. Position 1.
2. Opening *A*, with the left index finger alone.
3. The right index and middle fingers pass on either side of the ulnar string of the left index loop and pass proximally under the left palmar string to return with it.
4. The left middle finger passes proximally under the right palmar string where it crosses the base of the right middle finger and returns with a loop.

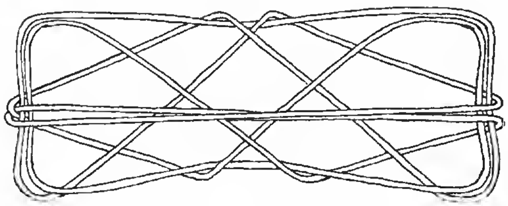


FIGURE 301.—String figure, *ati* (no meaning giving) obtained at Fitiuta.

5. The thumbs pass proximally under the radial strings of the little finger loops and pick them up on their backs.
6. The little fingers pick up the ulnar strings of the thumbs by passing proximally under them.
7. The index fingers are passed down through the triangles formed by the index loops and the double strings which cross them.
8. The middle fingers are passed down through their own loops on the mesial side of the double transverse cords which cross them.
9. The index and ring fingers are turned with the palmar surfaces outwards and all other finger loops dropped.

MONGAMONGA

1. Position 1 with the right hand, give the main loop one twist and take up Position 1 with the left hand.
2. Opening *A*.
3. Hold the hands with the fingers upwards. It will be observed that the ulnar strings on the little fingers and the radial strings from the thumbs cross at a lower level than the other two crossings. Of the other two crossings on the higher level, one is ulnar and the other radial.

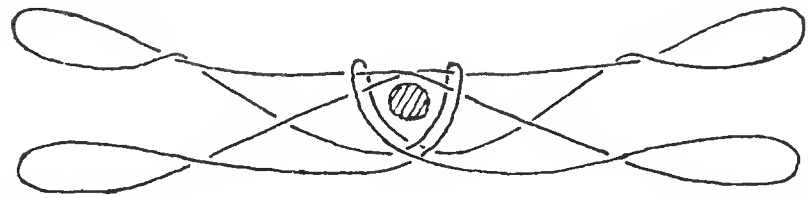


FIGURE 302.—String figure, *mongamonga* (cockroach) obtained at Fitiuta.

An assistant passes the right forefinger above the ulnar crossing, below the lowest crossing, and above the radial crossing.

4. The index finger loops are slipped. The assistant's finger which represents a cockroach is caught as the hands are drawn apart.

IPU

1. Opening *A*.
2. Slip the index loop of either hand back over the whole hand to rest on the back of the wrists. This is done by passing the middle ring and little fingers up proximally through the index loop and then the thumbs.
3. Pass both thumbs proximally under the radial strings of the little finger loops and bring the strings up on their backs.
4. Pass the little fingers proximally under the ulnar strings of the thumbs and lift them up on their backs.

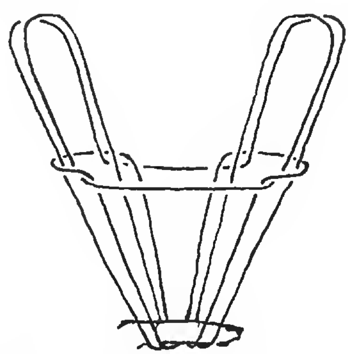


FIGURE 303.—String figure, *ipu* (cup) obtained at Fitiuta.

5. An assistant hooks a forefinger round the strings which cross at the middle by passing the finger laterally from palm to palm and holds the strings down.
6. The thumbs and little fingers are removed from the loops round them, the wrist loops are dropped and the thumbs and little fingers reinserted in their previous loops.

7. The assistant pulls down and the player tightens the loop which results in the cup figure.

Continuations from *ipu* figure: *a, laulau*—before assistant lets go, she holds the two middle strings running antero-posteriorly which results in a figure called *laulau*; *b, fa'amavaenga*—the assistant lets go and the figures run or separate (*fa'amavaenga*).

FALE SA

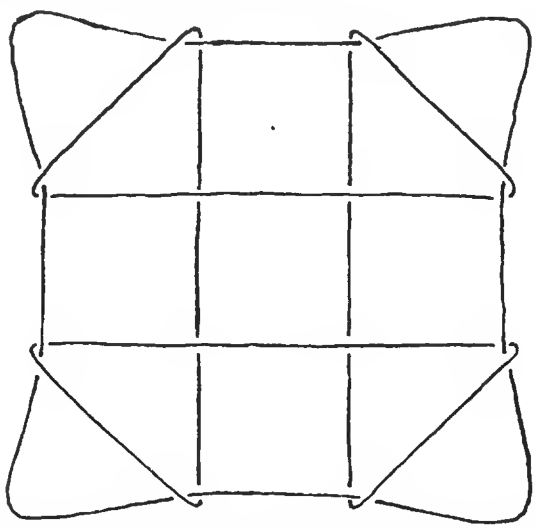
By two players.

1. Opening *A* by both.

2. The first player passes both hands through the index finger loop of the second player who drops the index finger loop over the first player's wrists before he withdraws.

3. The second player now passes both his hands through the index finger loops of the first player who in turn drops his index finger loops over the second player's wrists before he withdraws.

Left thumb (1) *Right thumb (2)*



Right thumb (1) *Left thumb (2)*

FIGURE 304.—String figure, *fale sa* (church) made by two players. Obtained at Fitiuta.

4. The second player turns his hands so that his strings are vertical whilst the first player holds his hands horizontal to make his strings cross the others transversely.

5. The first player removes his fingers and wrists and wraps his strings transversely round the vertical strings held by the second player. He rolls the wrapped strings between his palms as by-play.

6. The second player places his hands horizontally with the fingers up.

The first player takes the thumb and little finger loops from the right hand of the second player who drops the wrist loop.

7. The second player takes the little finger loop and the thumb loop from his left hand with his right free hand, drops the wrist loop, and then takes one of the loops with his left freed hand.

8. Both players pull on their loops with their thumbs and the loose wrapped string straightens out into the figure.

The girls demonstrating the figure sometimes made mistakes by getting the wrong order. It was interesting to note that they really thought the wrapping and rubbing of one string round the other was necessary to success. When the figure was purposely done without wrapping and rubbing, their surprise was unbounded.

In addition to Hornell's method of the *vaepato* (16, pp. 71, 72, 75) the *ili* figure and the *moenga* were obtained.

JACK STRAWS

An indoor game (*fiti*) is played by flicking light rods off a roll of matting with the finger and thumb. The rods are about 18 inches long and range about the thickness of a lead pencil. The wood is *mosooi, fu'afu'a,* or the discarded *aumafuti* sticks after peeling off the bark of slender paper mulberry sticks. The number is large, but not fixed, varying with the number of people playing.

An ordinary pandanus leaf floor mat is rolled transversely and tied with sennit braid. The roll is set on end and a rod stuck upright in the folds to form a boundary at either side to prevent the bundle of jackstraws, which are laid on top of the mat end, from falling off. (See Plate XLIX, *B*.)

The game is played between two sides. All the players of one side follow in succession. Each man flicks off as many sticks as he can. If he misses, does not remove a stick off the end of the mat with a single flick, or removes more than one stick with one flick, he is out and the turn passes to the next. Each stick flicked off counts a point. When all the sticks are flicked off before a side has finished, the whole bundle is put back again on the mat. When all players of one side are out, their total score forms the number that the other side has to surpass.

The game sounds simple but the sticks get crossed on the mat and it becomes extremely difficult to flick one off without removing another.

DISC PITCHING

Another indoor game played with discs of coconut shell pitched towards the end of a long narrow strip of matting is termed *lafonga* or *lafonga tupe.*' The game is played by adults and particularly chiefs, though the young men of the village usually have a community set of discs with which they play amongst themselves.

The discs are called *tupe* but in the game individual pieces are referred to as *'ai*. The total number called *au lafo*, consists of two sets of five. Each set ranges in size from 2.5 to 3.5 inches in diameter, in the smaller four to a large one from 4.75 to 5 inches in diameter. (See Plate XLIX, *C*.) Thick coconut shells (*niu mafiafia*) are selected for making the discs, the thickness being 0.2 inches or slightly more. In the four smaller discs, the edges are rounded off, but in the large ones, they are cut straight like a kava bowl. The discs are circular and the concavity naturally varies with the size. The large discs are formed from the side of the shell and not the ends. The outer convex surfaces are studded with small holes arranged in patterns and lime filled into them to make the patterns stand out. The large disc invariably becomes cracked across and is joined together by opposite pairs of holes with lashings of fine cord. The joins add to the value of the disc as it indicates age. Craftsmen making sets for sale, deliberately break the large discs and join them with lashings to increase their sale value.

The mat used to provide the marks is about 6.5 inches wide, plaited in check with wide pandanus leaf wefts, and several feet long.

The game is played by opposing pairs who take up their positions at the ends of the spread out mat. One pair pitch alternately up to the other end, the mark being the far edge of the mat. The two sets of discs are differently colored, one being light and the other dark. The large disc is named *to'e 'ai* (remaining piece) because it is reserved for the last to displace the opponent's disc that holds a scoring position. The discs must remain on the mat to score. After the opposing pair at one end have thrown their *to'e 'ai,* the score is counted and the other pair compete from their end. The score to win was ten according to one informant, but others said it was one hundred.

Much excitement prevails over the game and the loser was always supposed to hide his feelings and force himself to laugh. This results in the saying: " 'O le fa'a'ata'ata o lafonga" (The forced cheerfulness of *lafonga*).

Narratives occur in which stakes as high as life itself were played for. Fraser (12, *a*, p. 112) records the *solo* or recitative song of Liufau in which is described how Liufau and Lua-le-manga had to play for the lives of their men and themselves against the king Tupu-i-vao and Mauava.

Schultz (28, p. 118) in quoting a proverb explains that at one time, chiefs used pieces of human skull as discs. One of the large discs being mislaid, a coconut shell substitute was used which cracked the bone pieces, and thus led to the change of the material.

Disc container. The discs were kept in a larger coconut shell cup (*fafao*). When the game was over the discs were put away in the *fafao* which ended things. Hence, the saying to denote finality: " 'Ua atoa tupe i le fafao" (The discs are all in the container).

DISC THROWING

A disc (*te'a*) was thrown for distance in the game of *te'anga*. The word *te'a* in the various forms of *teka* (New Zealand and Cook Islands), *te'a* (Society Islands), and *ke'a* (Hawaii) denote the throwing dart which the Samoans call *ti'a*. The disc, however, is thrown in the Cook Islands and Hawaii under different names. Disc throwing in ancient times enjoyed a greater reputation in Samoa than dart throwing. It has now gone completely out of fashion, but a demonstration was given by Vei of Vailoa, Tutuila, who in his youth was champion of the district.

The disc was made of coral stone or green breadfruit. The breadfruit, preferably the *ma'afala* kind, was cut to a transverse slice about 1.5 inches thick and about 4 inches in natural diameter. The disc was trimmed round the periphery to make it a quarter of an inch thinner. The stone disc was made of *punga* coral rock. Generally a natural waterworn piece was used, but some were trimmed. The disc seen was a waterworn piece, but had been used as a *te'a*. It is very crude as compared with the grained and polished *ulu maika* discs of Hawaii. In recent times, oranges (*moli u'u*) were used instead of discs. The oranges were jerked behind the back without a bark strip.

The throw. The disc was thrown with a strip of *fau* bark wound closely round the periphery and the end twisted round the right forefinger. The disc was held between the thumb and middle finger while the forefinger embraced the adjacent part of the periphery. The player measured off by eye an appropriate running distance from the mark. Standing at a right incline, he made preparatory swings across the body with both arms, the right with the disc crossing above the left. Then, with a series of steps, he ran sideways down to the mark. He reached it with his left side towards it. The right arm swung round the body from front to back and delivered the disc with a sharp jerk from behind the back in the direction of the course. As the disc left the hand, an upward lift was given to the bark strip which gave the disc a top spin forward. The disc bounded forward at first in a series of jumps and then ran evenly on its rim. The throwing strip of bark is called *tafau*. Occasionally the disc was thrown without the strip of bark.

The ground is the usual village road. The part from which the disc was thrown was termed *panga* and the actual mark from which the disc was delivered was the *ulupanga*.

The game was played between two sides. All of one side threw before the other commenced. All throws made by one side, which surpassed the longest throw of the other, counted. The calls and methods used were similar to those used in dart throwing. Various songs were sung while waiting and after a good throw. Such a one used as a chorus in reply to the leader's shout of "Mua o" was given me by the aged expert, but without translation.

'Mua o. Mua pea ia ae'ou tali a tua,
Ia songia le ulu na mua, Mua o.
Mua o. Mua pea ia i panga vale,
Ata masuisui a'e. Mua o.
Mua o. A'ua mua, mua pea ia.
Fa'afetai 'ua ausia. Mua o.

When a team scored ten points, it had scored an *ulu*. Arrangements are made beforehand to compete for so many *ulu*. If a game is for five *ulu*, the team which first gets three *ulu* wins the game as the remaining two *ulu* cannot affect the result.

Schultz (28, p. 121) gives the following saying: " 'Aua le aoina le te'a muli" (Do not gather the last thrown disc). The application is not very obvious as the last player was generally the best and his throw was termed the *te'a muli*.

DART THROWING

The wide-spread Polynesian game of throwing darts for distance is found in Samoa. Here, however, the dart is called *ti'a* as against *teka* in eastern Polynesia. The term *te'a* (Samoan form of the ward *teka*) is applied to the throwing disc. The act of casting the dart is *tati'a* and the game, *tanga ti'a*. Dart throwing must not be confused with spear throwing (*tolonga*).

The dart. The *ti'a* dart was originally of cane (*u*). The Tutuila people held that the cane flew too far and was banned. This is quite explicable in places where a suitable length of clear ground was not available. At a competition seen in Vaitongi, the darts of shorter travelling wood caused some delay when an extra good cast passed the ordinary bounds and landed in a *talo* patch.

The wood commonly used is *fu'afu'a*. The dart, after it is peeled, is about as thick as the little finger. It was rubbed smooth between two short pieces of wood termed *suni*. Each player carries these pieces and rubs his dart between casts. The dart has a specific name according to its length:

Tapu'u. From the middle finger to the elbow.

Tasali. From the middle finger to the shoulder.

Talu. From the middle finger to the breast bone.

Velo. From the middle finger to the opposite shoulder.

Ulu toa.

The *ulu toa* was longer than the *velo* and as its name implies, it had a head (*ulu*) of *toa* wood attached to the shaft, thus resembling in principle, the darts of Niue.

The ground was an ordinary clear space in the village on the road. The part at either end from which the darts glanced off the ground was termed *panga ti'a*. A slight rise was preferred and the loose sand scraped away to

provide a rise. Children may be seen glancing the darts off the level ground, or even off loose sand.

The sides of the course were known as *tapula'a* or *afenga*. Hence the saying, " 'Ua tulia afenga" (The sides are occupied by standing people), which denotes that everything is ready.

The game is played between two sides, the number depending on mutual arrangement. In the game, one side is called *auti'a*. Played between two villages, the game is a *tavasaunga*. All the players of one side threw a dart each before the other side commences. The side waiting beguiles the time with song such as one commencing with "Aue lulu, aue moa." The team leader throws first and follows up his dart so as to exhort and encourage his team from the other end. He is usually a mediocre player, but a humorist gifted with eloquence and an adept at posturing and grimacing. A judge and markers are appointed.

The throw. The dart is held at the thinner end between the thumb and middle finger with the forefinger over the end. The throw (*ta*) is made by taking a short run, turning sideways and throwing the head of the dart in a slanting direction to glance off the surface of the ground. An upward slant in the ground thus assists the dart in rising and hence the sloping of the *panga*. The dart is thrown at the ground in two ways: *a, velo,* with an overhand sweep; *b, tasali,* with an underhand motion.

Success depends on the skill with which the striking angle of the head with the ground is made, so as to cause it to ricochet off the surface. The correct action is called *fa'amasau,* but if the head misses and only the tail touches, it is *pa i'u*. If the dart misses the ground altogether, it is termed *fa'alele* and the throw disqualified. If the head strikes the ground at too abrupt an angle (*sulu panga*) it fails to rise. Where it strikes the ground twice, it is *panga lua*. When it does not rise, but runs along the ground like a lizard (*mo'o*), it is termed *sulumo'o*.

The flight. The perfectly thrown dart strikes the *panga* a glancing blow, rises gradually with a trajectory like the flight of a golf ball and flies straight and true down the course accompanied by yells of approval. Such a dart is called *ti'a ulu tonu* as against the *ti'a ulu afe,* the dart which turns to the side and thus loses distance. Hence the saying: " 'O le ti'a ulu tonu lou finangalo" (As the straight flying dart are your thoughts).

A similar thought is expressed by using the term *seu* from pigeon netting, where the high flying piegeon cannot be caught: "O le ti'a e le seua lou finangalo" (As the dart which cannot be intercepted are your thoughts).

The word *ulu* (head) used in some of the expressions applies to the head of the dart. The dart that flies too high is *ti'a ulu manu* and the one that dips too quickly is *ti'a ulu tofu*. The object is to pass the other throws which is expressed by the verb *'ausia* while to pass beyond the furthest dart is *'ausiti'a*.

The contest. The longest throws are marked by official markers. All long throws count until they are surpassed. When the second side throws, all the darts not reached by their furthest throw count to the other side. On the other hand, all throws that pass the furthest count to the throwing side.

The leaders exhort their men with shouts of "Maui! Maui!" In a close finish, the leader of the side which got the judge's decision shouted out a saying from the game of *tapalenga;* "Le uto 'ua tingi" (The float has reached the goal). His side replied with the chorus of "Tingi o." After the leaders of either side throw, they go forward to the other ends where they watch results with the judge and markers. The teams, however, remain at the casting end until all have thrown when they go to the other end to pick up their darts and then cast the next round from that end. At the end of the round the judge gives the number of points scored by the particular side. The leader of that side immediately transmits the results to his team, who were crossing over, by wild capers and the yell of "Mauia!" (meaning a point). His team replied with "Maui," and the leader repeated "Maui" for each point scored in the round, his team replying after each call. In casting, when a dart went ahead of the best recorded, the leader yelled, "Mua" (in front), and his team shouted back, "Mua o." Before casting, a player anxious to excel used the following incantation, whilst he twirled the head of his dart on the ground:

"Vilivili Tonga.	Twirl Tonga.
Vilivili Tonga.	Twirl Tonga.
Sau le aitu ma le amonga.	Comes the spirit with his burden.
Ta la'u ti'a.	Cast my dart.
Lele 'i Tonga."	Fly to Tonga.

It was a coincidence apparently, that the thrower who recited the above to me, immediately after made the winning throw of the round. Later, however, it did not prove effective.

On changing ends, the winning thrower of the last round has first throw. The game goes on until one side reaches the number decided on. No special form of counting such as in eastern Polynesia, could be obtained. At Vaitongi, Tutuila, where the game was seen being played by adults, it went on for hours without anyone keeping a count of the total.

A winning cast about which there is no doubt has given rise to the following saying: " 'O le mua e le fuatia" (The winning cast is not measured).

The saying is used to accompany presents in return for hospitality when the receiver depreciates what he has done. The reply infers that his kindness cannot be measured; it is so outstanding.

Protests. When two throws of opposing sides are so close as to render a decision difficult, the judge calls it a draw and asks the teams, not the two

individual throwers, to throw again. The decision is left to the casting ground. Hence the saying: "Tu'u ia mo panga." (Leave it to the casting ground). It is often used by a diplomat who wishes to shelve a difficult question.

Pratt (23, p. 246) gives *puketa* as an exclamation of triumph used in the game of *tanga ti'a,* which is derived from *puke,* an interjection meaning catching you. He states it is the only word with *k* until the recent corruption of *t* into *k*.

Dart thrown with a cord. The dart (*ti'a*) termed *ti'a tafau* (*ta,* to throw; *fau,* hibiscus bark) was thrown as the name implies with a strip of *fau* bast. The bast strip was tied in an overhand knot at one end and two methods of applying pressure over the knot to hold the cord on the dart are shown in figure 305.

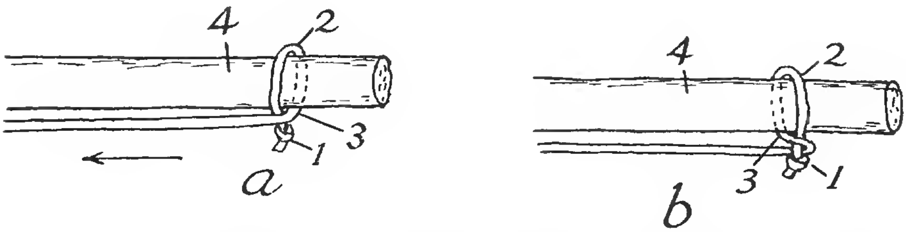


FIGURE 305.—Dart with throwing string (*ti'a tafau*): *a,* The knot (1) on the end of a strip of bast is laid against the dart (4) near the tail end. The bast is passed over the dart (2), brought around on the right (3) of the knot, and passes over the strip to the inner side of the knot. By keeping the bast taut, the turn around the dart is prevented from slipping by the knot (1). The other end of the bast is twisted around the right forefinger, and keeping the bast taut, the dart is held towards the head end. When the dart is thrown, the pressure over the knot relaxes and the turn (2) around the dart releases. *b,* The turn (2) comes around the dart (4) on the left side (3) of the knot (1) and then passes around the knot. The forward pull of the bast strip keeps the turn (2) fixed against the knot in the same way as (*a*).

The use of the throwing strip gave extra length to the throwing movement and thus acts on the same principle as the throwing sticks of the Australian aboriginals. The forward pull against the knot kept the bast turn round the dart in position, but when the dart passed forward, the pressure was removed and the throwing strip automatically released itself without impeding the flight of the dart. The dart so thrown was glanced off the ground in the same way as the darts without the throwing strip. Any of the darts could be thrown with the knotted strip but the short *tapu'u* dart had to have a coconut leaflet midrib stuck in the end to furnish a tail to make it fly truer.

In another method the throwing strip tied to a handle was wound spirally round the dart after fixing the knot. The dart was laid on the ground and jerked forward with the handle. Both methods were used in Aitutaki, Cook Islands (39, p. 338).

Children's dart game. A forfeit game (*tapongo*) is played with *ti'a* darts by boys. The poorest thrower in each round is termed *mona*. He is struck by each of the other players with their darts. The *mona* has the privilege of first thrower in the next round. The *mona* of each round pays the forfeit of being struck. The game continues for eleven rounds. A refrain is sung as the penalty is being enforced, a number accompanying each stroke.

Tasi ma le sua o le ma'i.	One and the food of the sick.
Lua ma le sua a le olomatua.	Two and the food of the old woman.

Other numbers follow with their particular accompaniments.

SPEAR THROWING

A military exercise or game (*tolonga; tolo,* to throw a spear) was generally indulged in as practice when war was impending. It was regarded by others as an ominous sign. If news arrived that a particular village was playing *tolonga,* other villages that had reason to suspect such activities were at once on the alert in taking defensive measures to provide against attack. The game was played by opposing sides casting spears at a target.

The target was formed from the stem of a young coconut tree, dug up with the rounded part of the root. The root end with the bulbous lower part of the stem was trimmed up as the actual mark and the other end buried in the ground to raise the target about 6 feet from the ground. A transverse ring (*fusina*) was cut below the bulb. The sides above the ring or boundary was called the *fa* and the cut off circle of the root which faced upwards was the *niu sina* or bull's-eye. A spear landing in the bull's-eye was the highest possible achievement in the game and was metaphorically applied to civil life. This originated the saying: " 'Ua tau i niu sina 'ae le tau i fusina" (It has landed in the bull's-eye and not on the boundary). If a man marries the daughter of a high ranking chief, he has struck the *niusina,* not the *fusina.*

The spears used are of two kinds; *au velo fua,* and *'ape-tao.*

The *au velo fua* are the ordinary spears used which range from 10 to 14 feet in length as suits individual players. They are usually made of *olasina* wood. One end is thicker and is sharpened.

The *'ape tao* (*'ape,* to pluck out, and *tao,* spear) is so named from its being made larger and heavier than the others and used to dislodge opponents' spears that are stuck in the bull's-eye. In such cases it is thrown first by the second team and at a slant or crosswise to knock the scoring spears out of the target. When not so needed it may be thrown as an ordinary scoring spear.

The game. The number of players in each team is left to mutual arrangement. The starting mark is about 15 yards from the target. All the players of one side throw before the other team commences. As the bull's-eye faces upwards, the object is to throw the spear with a high trajectory so that it may fall fairly vertically on the mark.

To score, the spear must remain stuck in the mark after both teams have thrown. The spear in the most central position scores as do all those on the *niu sina* that are nearer the center than any of the opponent's spears. When a member of the first team scores in good position, the following players of that side attempt to protect their scoring spear by sticking spears in front of it and on the side of the vertical portion (*fa*) facing the throwers. The command given by the leader has also become a saying applied to any preventive measures: " 'Ia puni lava le fa" (Fill up the front of the target).

If the front of the target is filled with spears the ends of which stand obliquely upwards, it is extremely difficult for the following team to knock out the scoring spear with the heavy *'ape tao*.

The target chip. A curious score is obtained when a spear pierces the edge of the *fa* and carries away a piece of the target with it. So long as the chip which is termed *laufa* remains imbedded on the spear point, it scores a point. Hence: "Numia ma le laufa" (Spear with the target chip).

Schultz (28, p. 115) gives another interesting saying applied to a chief living in a strange village who on addressing visitors from his own village, apologizes for himself by saying that he has no status away from home. The visitors reply by quoting: " 'O le tao e alu ma le laufa" (The spear goes with the target chip adhering to it).

The chief is the spear, and his status and title, the target chip which clings to him.

On the other hand, when a chip is knocked off without sticking to the spear, it is of no account and is likened to a chief without home or supporters: "Laufa le ainga" (A target chip without relations).

Laufa is a talking chief's title in Safotu, Savaii, now held by Timu. Timu's father, Laufa was one of the first council (*fono*) of thirteen talking chiefs under the German Administration, of which Toelupe of Upolu is the only survivor.

Other sayings. Pratt gives *taosala* as a spear placed high up in the hilt of the target and *tusala* as to stand in the wrong place. An old man in a village whose contemporaries have all passed away is referred to as, " 'O le tao 'ua tu'ua i le fa" (The spear left in the target).

The side boundaries of the throwing ground are called *'aulape*. Before the game starts the *'aulape* are defined by the people of the village not taking part in the contest. This preliminary gathering is used metaphorically to denote that all is ready for any project that is being planned: " 'Ua ta'oto le 'aulape o le nu'u (The side boundaries of the village have been formed).

The above is a variation of the saying concerning the *afenga* boundary in the dart casting game.

CLUB MATCHES

Club matches (*aingofie*) were much in vogue at some of the important gatherings, but have now been entirely abandoned. They consisted of hand to hand fighting and formed an excellent opportunity for the warriors to display their skill and prowess.

The club used was made of the large *lapalapa* midrib of the coconut leaf. The butt end was used for striking and the thin, curled side edges were trimmed off. As the butt was liable to split, it was bound transversely with sennit braid. The thinner part formed a natural handle from which the leaflets were removed thus making a club with an expanded head. The club was about 4 feet long and was used with both hands.

The game. Churchill (5, p. 13) gives a description of the procedure. Each warrior had a second (*nafa*). The challenge was delivered by the warrior brandishing (*oli*) his club with the head upwards or causing it to quiver (*vilivili*) as he struck light downward blows on his left hand and then drew the club over the palm. The challenge was similarly accepted.

The contestants then paraded between the two opposing forces. The seconds took their position to the left and slightly to the rear of their principal's opponent. Churchill states that the seconds' duties were to obscure as they could not take part in the contest. The principals were placed back to back (*fefulitua*) facing their own parties who saluted them by raising their clubs. After receiving the salute, they turned and leaped back into position.

Owing to the heavy nature of the clubs, there was none of the light footwork and quickly changing positions that marked Maori club exercises. Also, as there was no point, there were no thrusting blows. The principals seemed to stand up to each other and simply strike diagonal, right handed blows, relying on the sheer weight of bruising blows to place their opponent out of action. The parry was used, but there is no information as to fine points of the system, if there were any.

Churchill (5, p. 13) states:

> The stance is of the utmost importance, and the object of each fighter as soon as he comes within reach of his opponent is to dig footholds, the left foot forward, and much of the chance of success in the combat rests in the fortune of being able to establish oneself firmly. The skilled fencer will not leave his foothold, if satisfactory at the beginning, until his enemy is disabled or gives ground.

From the above data, there seems to have been little variety in the scope of attack and defence. Churchill (5, p. 9) gives a number of words used:

Ta, the general word for a blow.

Si'ita and taualunga, raising the club to strike.

Faivaaulima, the first blow struck.

Fa'anunuta, general rally of interchanged blows.

Tatavale, ill directed blows.

Tapolo, a well directed blow.

Talita, to parry a blow.

The fight went on until one was disabled or lowered his hands (*taulalo*) in token of defeat. The victor tossed his club in the air and raised the *ailao* yell whilst his party shouted *"tue"* in triumph.

Sham fights. Stair (34 *a,* pp. 55, 56) gives the following data on sham fights at religious festivals:

In the Aana district of Upolu, they took place at the central *malae* of Le Ulumoenga at the dedication of Aana to the god Le Fee. In Atua, Upolu, they took place during the festival of the "Carrying of Atua to Tupua-le-ngase," first at Moamoa in Falefa and then at Falepapa in Lufilufi. A picked company of Atuan men called Tulanga-a-Sasavea were champions of the district and challenged any visitors to single combat at the Moamoa gathering. On the following day at Falepapa, another picked company called Tulanga-a-Sasavai challenged the visitors. The warriors who had contended with each other the day before exchanged their ti leaf kilts in token of good will.

The stand-up fighting from stationary footholds, with heavy clubs capable of a limited number of strokes, is interesting as indicating an early form of military exercise in which endurance and strength were the main factors to success.

SUMMARY

Material objects. From the point of view of material culture, Samoan craftsmanship produced little in the objects connected with amusements and games. The people had recourse to the natural material supplied by their environment and expended but little effort in effecting improvements on nature. Children obtained their toys from the leaves of coconuts, their swings and skipping ropes from vines, and small pebbles from the house flooring furnished them with jackstones. The stilt and the surf board which would have required some technique are both doubtful. The coconut was used for tops and teetotums while the wooden top used did not progress far in the way of evolving types of any value. Adolescents and adults did little better. The candlenut leaf furnished the flying pigeon, the discarded *aumafuti* sticks of the paper mulberry formed jackstraws and the butt end of the coconut leaf midrib provided toboggans and the dummy clubs used in sham fights. Even the important games of dart and disc throwing had recourse to simple sticks and slices of breadfruit or naturally rounded pieces of coral. The pitching discs were the only objects upon which craftsmanship was expended to any extent and they were, as a result, regarded as of some value and carefully preserved. The spears also took some trouble in making. In spite of the simple nature of the material used, they fulfilled the object of giving pleasure and enjoyment to the community.

The social value of the community games was important. The smaller competitions in the same village brought the young people and adults together

and gave them some relaxation from the perpetual quest for food on land and sea. The competitions between different sections of a village or different villages brought together a larger group of people on terms of social intercourse. The local people had to provide food for the visitors, spectators as well as competitors, and the occasions were social events in which all feasted as the foundation of enjoyment. Singing and dancing added to the festive nature of such occasions. A Polynesian attending the sports of people of a higher culture is struck by the lack of organized hospitality in providing free food and drink which is so characteristic of his own culture. In the return game played at the other village, the hospitality previously received was returned, if possible with added interest. In thus promoting social intercourse of a friendly and enjoyable nature, games of a competitive character between different villages held an important place in native society.

MUSICAL INSTRUMENTS

Under the heading of musical instruments will be grouped together all instruments or objects from which sound is produced for the purpose of giving time to dances, for giving notices and warnings, and for making sounds for the pleasure conveyed by the sounds themselves.

DANCE TIME IMPLEMENTS

Ceremonial speech, food, and presents marked festive and important occasions. The natural accompaniment was singing and dancing. Dancing in the form of the *siva* and the *poula* contained a number of figures composed of different movements and postures. These were performed by groups representing various villages, or in the local gatherings, various divisions, or family groups in the village itself. Usually after combined figures, individual dancing was indulged in. In all group dancing, the movements were made in unison and faultless time was the criterion of excellence. A method of beating time was a natural accompaniment of dancing. This was done by singing, clapping hands, and beating time on some object. Hence, every dancing party had a small orchestra, to provide the time, not only for the dancing, but incidentally the clapping of hands and the singing. The orchestra remained seated cross-legged on the ground behind the dancers. When individual dancing took place, the rest of the dancers remained seated and added their voices and hand clappings to that of the orchestra. The time beating instruments are very simple.

Rolled floor mats (*fala*). The ordinary coarse pandanus floor mats are simply rolled to form a hollow cylinder and tied with a strip of bark or braid to prevent it coming unwound. This simple type of drum is then beaten with two light sticks and the rhythm of the sharp taps gives excellent time. To beat the mats is *tafua* and the phrase for beating the mats to commence the

dance is *tafua le fala*. The leader of the dance will call "Tafua le fala," and the dance commences. The time is perfect and various flourishes are introduced. One or more rolls may be used and the companions of those beating time also keep time with hands and voices.

Rolled mats with bamboo (*tui' tu'i*). A number of pieces of bamboo varying in length from 4 feet downwards, with one end open and the other closed by a node are wrapped up in a floor mat with the open ends enclosed in the mat. This improved instrument is beaten with two sticks in the same way as the simple mat roll, but the hollow bamboo rods give a different sound. Different sounds may also be produced by beating on different parts of the instrument. Turner (41, p. 125) states the open ends of the bamboo were enclosed in a mat bag but he probably meant the wrapped mat. A mat bag requires a special plaiting technique and no such article was mentioned during my inquiries about plaiting. The Samoan does not usually make a special object if something in common use will serve his purpose. Both the mat roll and the bamboo roll were expedients used for the occasion and neither was a permanent arrangement reserved for beating time only. When the dances were over, the cords were unfastened and the floor mats resumed their ordinary functions.

Bamboo lengths (*'ofe*). Sometimes the preceding instruments were further assisted by a few of the orchestra using various lengths of bamboo, with one end open and the other closed. The closed end was thumped on the ground in time with the beating on the mat and the various lengths naturally emitted different sounds. The example of the short length in Plate L, *A*, 3 has the upper open internode split in a number of places to add a rattling sound to the usual booming hollow sound of the whole column.

The smaller wooden gongs were also beaten to give time to the dances. Nowadays discarded biscuit or benzine tins are preferred. It rather detracts from appearances to see the men and women arrayed in their best, garlanded with wreaths, and glistening with coconut oil going through the various postures and movements in perfect unison to the time produced from an empty kerosene tin at the back of the serried lines. However, the tin requires no physical effort to hollow out, it costs nothing and gives a better sound than anything evolved by native culture. Incongruity gives way before utility.

THE WOODEN GONGS

The instruments made from the section of a branch or trunk of a tree, hollowed out through a fairly narrow longitudinal opening, which does not quite reach the ends, are wooden gongs. These hollowed dugouts with ends cut off at right angles to the long axis are beaten with one or two sticks and emit a louder sound consonant to the hollowing out. Three well-marked classes are distinguished by size; the *pate*, the *lali*, and the *longo*. All these

types are held to be introduced from other islands. A fourth type (*nafa*) is held to be true Samoan.

The small hand gong. The *pate* is the smallest of the gongs. Two varieties are shown in Plate L *A*, 1 and 2; one with the ends cut off square, and the other with one end produced to form a handle.

The inside hollowing follows the elliptical section of the wood, the narrow longitudinal opening being along one end of the ellipse. The hollowing stops a little way from the ends, which are also slightly hollowed from the outside. Different notes which the musician utilizes are thus produced by beating over the middle and over the ends.

Pratt (23, p. 235) states that the *pate* was introduced from Tahiti; this was done by the missionaries and the Tahitian and Cook Islands name of *pate* was brought with it. The *pate* is now extensively used throughout the islands to give notice as to school hours at both the Government and Missionary schools. In Tau and other parts, a couple of the older children walked through the village with the light *pate* resting on the fold of the left arm whilst the right hand beats on it with a single stick or *'auta*. The *pate* has thus become associated with school notices in distinction from the sounds made with other instruments for different purposes. The sound of the small instrument conveys notice to the small people.

The *pate* is sometimes used to call pigs (*vala'au 'ai pua'a*) when an owner takes food to the pig enclosure. The enclosures are fairly large and covered with natural growth, but the sound of the *pate* soon brings the pigs at full speed to the food that it announces.

The *pate* may be beaten with two sticks at dances. In the true home of the *pate*, it is essentially the instrument for marking time in the dances.

The medium-sized gong (*lali*). The *lali* are made in the same way as the *pate* with both ends squared. They are made out of larger sections of tree trunks and are thus stationary instruments on land or in canoes. The true *lali* are used in pairs which have a slightly different note purposely tested during the hollowing out.

The pair figured in Plate L, *C*, belong to a Savaiian village. Each *lali* is beaten with two sticks (*'auta*). They are placed under a shed in a central place in the village and are beaten by two men who blend the different notes of their instruments as they play. They are used to call the village people togther for some meeting connected with village affairs.

The Samoans state that the *lali* was introduced from Tonga during the Tongan occupation. The Tongans used them on their war canoes and beat them in a preliminary barrage of sound as they paraded before the villages ere commencing an attack. They were also beaten on peaceful occasions to announce the arrival of some visitor of distinction. Another name given to the *lali* is *fafangu*. The beating of the *lali* to call meetings together is a

modern usage. The Tongans used it only to announce chiefs and this usage is summed up in the word *fa'aali'i*.

The large gongs. The *longo* is a great hypertrophied gong made from the trunk of a large tree. A very large one in Bishop Museum was obtained at Fangasa, Tutuila. Some idea of the labor involved in making it may be formed from its history. The *longo* was made from a *talie* tree that grew in the district of Vaatia. Thirty men tried in vain to drag it to the sea, but the party, reinforced to 70 men, were successful with great difficulty. Ten trunks of *mosooi*, each as large as the supporting pillar of a round house, were made into a raft and the *talie* log placed on it. The raft sank. Two *fautasi* boats with 12 and 14 thwarts respectively, were sent to float the raft. Divers attached a strong rope to the raft. A piece of stout timber was stretched over the two boats and the rope hauled over this cross piece. After the raft was hauled about half way up to the surface, it was towed, thus submerged, to Fangasa, an operation which took two days. It was left outside the reef, buoyed up. On the third day, it was dragged on to the reef. After landing the log, the *longo* took 14 days to make.

The *longo* is beaten with a heavy beater (*'auta*), which is thrust against the inside of one edge of the opening. The original beater was of *olasina* wood; the present one is of *ala'a*.

This huge and unique *longo* was obtained by negotiation through Mr. Judd; the Fangasa people realizing that the *longo* would soon decay through exposure, wished to have its life prolonged in an institution where it could be taken care of. The *longo* is named *'O le sui fofonga o le Atua* (The Voice of God), so called from its being used to summon the people to church.

The Fangasan people maintained that the *longo* was termed *lali* originally and after the course of time the name became *longo*. Some maintain that the idea of the very large wooden gong comes from Fiji. Whether the idea came from Fiji, or not, it is evident that the *longo* is a development from the smaller *lali*. The very large form became associated with churches to serve the function of church bells and the name of the type became *longo*. Whilst very large *lali* may have been made in the past, it is certain that in Samoa the manufacture was increased by the adherents of the new faith, each village desiring one for their church. The accomplishment of their desire was rendered possible by the use of steel tools. Throughout Samoa, the *longo* is "the Voice of God" that summons the people to worship. It is an old time voice, strengthened by modern methods, whose sound is used in the interests of a new faith.

The Samoan gong. As to whether there is a modification in structure between the Samoan gong *nafa* and the *lali*, it is difficult to say as no examples of the *nafa* were seen. An old man at Taputimu, Tutuila, reputed to be an expert player on the *nafa*, was commissioned to make one, but owing to his ill

health the *nafa* did not materialize. It was a dugout of wood belonging to the wooden gong class, but was played differently. Two sticks were used and various tunes and rhythms were produced by the expert who showed off his skill by beating the sticks together and tossing them in the air in time to the tune he was playing. Evidently a greater range of play was associated with the *nafa* than with the *lali*.

Many of the Tutuilan people claimed the instrument as a true Samoan one in distinction to the introduced *lali*. They spoke of it as *tangafa*, in which *ta* is a prefix meaning to beat and *ngafa*, an illustration of the modern tendency to mix up the *ng* and *n* sounds. Pratt (23, p. 221) gives *nafa* as a native drum but *ngafa* bears no similar meaning.

Stair (33, p. 135) refers to the *nafa* as a Samoan drum made of a hollowed log and now copied by the *longo* which he states was derived from Tonga; but the Tongan instrument is longer. He gives *fa'a-alii* as another name for the *nafa*, but the word should be *fa'aali'i*, which simply means to honor as a chief and thus designated the purpose of the instrument and not the instrument itself. In this usage, it bore a similar likeness to the Tongan *lali* which apparently it much resembled in form except that it was shorter.

From Stair's account it is obvious that some confusion exists regarding the words *lali* and *longo* and origins from Tonga and Fiji. It seems most likely that the distinction between *lali* and *longo* is of modern date, but that before the development of the large church *longo*, they were probably synonymous. Stair also bears out the contention that the *nafa* is the true Samoan gong and the others were introduced.

THE DRUM

The use of the word drum, so commonly applied by Pratt, Stair, Turner, and other authorities to the wooden gongs, is here reserved for instruments hollowed out of wood, but with some kind of skin stretched taut over a part of the hollow. The sound is produced by striking or stroking the skin.

The true drum is a marked feature of marginal Polynesia with the exception of New Zealand. It was evidently absent in Samoa for though some Samoans state that an instrument termed *itulasi* with shark skin stretched over it was formerly used, at the same time it was said to have been introduced from elsewhere. The lack of definite information concerning it bears out its foreign origin and the fact that it made no headway.

TRUMPETS

Trumpets (*pu*) may be made of shell or of wood. In Samoa two types of shell trumpets were used and a doubtful type of wooden instrument. The shell trumpets have the name of their particular shells, but when a hole is bored into them, they become *pu* from the Samoan word *pu*, meaning a hole.

This derivation of *pu,* while satisfactory in the Samoan dialect, may not be acceptable to the many other Polynesian dialects in which *pu* is used to denote trumpets.

Triton shell trumpet (*pu faofao*). The *faofao* is the widely used *Cynatium tritonis* with a hole a little over 0.5 inches in diameter chipped through the third whorl from the end. (See Plate L, *A,* 4.) No mouthpieces of wood were used, the trumpeter applying his mouth directly to the shell. The sound carries a considerable distance. The trumpets were used on the canoes returning from deep sea fishing to announce not so much their return, as the fact that they had made a good catch. They were also used by travelling parties voyaging by canoe to warn the villages of their coming, and to make a display. War parties also used the shell trumpet.

Cassis shell trumpet (*pu foafoa*). The *foafoa* is *Cassis cornuta* and to make the trumpet the apical whorls are cut off. (See Plate L, *A,* 5.) The *foafoa* is found more commonly in Samoa than the *faofao.* According to a head fisherman at Papa, Savaii, the *foafoa* were fished for on the sandy sea bottom outside the reef. A bait consisting of the cooked underground stem of the ti was weighted with stones and let down to the bottom. This attracted the shell fish which came to feed on the cooked ti. The fisherman returned and if the shell fish had been attracted they could be seen from the surface. He then dived for them. The *faofao* was also caught in this manner but not so often.

The *pu foafoa* is used for the same purposes as the *Triton* shell trumpet. In modern times, the shell trumpet forms the official announcing instrument of the village magistrate (*pulenu'u*). Any regulation or by-law is promulgated amongst a meeting of chiefs who are called together by a crier sounding the trumpet as he passes through the village and calling the place and time of the meeting. It has become a habit on hearing the sound of the trumpet to listen for the announcement which follows. One morning a week the trumpet may be heard followed by an exhortation to the various families to go forth and bring in their quota of rhinoceros beetle to the village magistrate, which the law demands as a measure for suppressing the pest. Thus the shell trumpet has merged with the elements of the new culture, and seems assured of a prolonged period of activity.

Wooden trumpet (*fa'aili niu vao*). Stair (33, p. 135) describes a *fa'a-ili-niu-vao* as a pipe producing louder sounds than the various smaller pipes or whistles. "It was formerly much used by parties of warriors on their march, or at their general musterings and reviews—*aungaau.*" The *niu vao* from which it is made is one of the Samoan wild palms.

SOUND INSTRUMENTS

Instruments which are used for other purposes beside the actual production of the sound itself have been described, but leave a number of instruments in which the sound itself gives pleasure or interest to the producer. Anything that makes a noise gives pleasure to children and the use of a primitive form of Jew's harp and whistles satisfied their needs. Adults attempted to play tunes by means of flutes, pipes, and a sounding board.

Jew's harp (*utete au lama*). This primitive instrument consisted of the midrib from a dry coconut leaflet (*aulama*) which, broken off into a convenient length, was held by the left hand against the teeth and vibrated by the right hand so as to make a chattering sound against them.

Whistles (*fa'aili*) or small trumpets were made by children out of various leaves by winding narrow strips in a spiral form. The leaves of the banana, ti, and pandanus were used, which gave the plant name to the whistle as *fa'aili laufa'i, fa'aili lauti,* and *fa'aili laupaongo.*

Bamboo flute (*fa'a'i*). A flute was made of a piece of bamboo into which four to six holes were bored. In Savaii, the name given to the instrument was *fa'a'i* and it was played a good deal by girls. Actual tunes were attempted and as it was evidently used to play love songs between younger people of both sexes, they got more out of the instrument probably than a skilled musician of another culture. Stair (33, p. 135) refers to the instrument as a *fangufangu*:

The flute, *o le fangufangu*, made of bamboo, was a favourite instrument with the young, and from it they produced a variety of plaintive notes.

Pan's Pipes (*fa'aili 'ofe*). Pan's pipes were made of five pieces of thin bamboo of varying lengths. These were bound together with a lashing termed *fausanga selu* (comb lashing), probably the wrapped twine used with combs. It is mentioned by Stair (33, p. 135) and Wilkes (42, vol. 2, p. 142), and there is no doubt as to its presence in Samoa. The late Mr. Gosche of Savaii, himself a skilled musician, told me that he had heard and seen the Pan's pipes played at Falealupo. An old man played a plaintive tune upon them, while an old woman sang in a nasal tone a song in time to the tune. Mr. Gosche said the tune was distinctly musical and pleasing, though unlike anything he had ever heard.

Sounding board (*pulotu*). Stair (33, p. 135) says that the *pulotu* or *fa'a-alii-la-iti* "a small instrument used to accompany a solo, was formed by fitting loosely a thin slip of board into a bed of close-grained wood. It was beaten with two small sticks, and although the sounds produced could not have been very pleasing, it was used exclusively by the higher chiefs, some of whom were considered to excel both in this instrument and in that of the *Nafa*."

DANCE ACCESSORIES

Some forms of kilts were specially made for the *siva* dances, and other activities that took place during festivals and food presentations. At these dances, model clubs were usually carried by the village maid and manaia chief of the parties. Hence the opportunity for display in the dances gave a certain amount of stimulus to the kilt making and model club industries. At the night dances of the *poula* type, the stiff ceremonial relaxed somewhat and extra clothing was not so much in evidence. Different forms of dancing were indulged in, and in many the various methods of making a noise, thus adding to the efforts of the orchestra, were in vogue.

A piece of coconut leaf midrib was trimmed and the ends split and termed a *sasa lapalapa*. These were used by the dancers and struck against the thigh and against the *sasa* of a neighbor in the various evolutions of the dance.

In some dances, each performer carried a stick in either hand with which time was beaten in company with the orchestra. The *sake* is the dance in which the sticks are used and is said to have been introduced from Uvea Island.

Two half coconut shells (*ipu*) are used as cymbals, really for marking time, in a form of dance termed *fiti* and perhaps introduced.

Stair (33, p. 134) says that the young people of inland villages used a pipe or flute (*'ofe*) of bamboo which they blew while dancing the *siva-a-'ofe*.

SUMMARY

Samoan methods of producing sound were materialized in instruments which display no great effort at craftsmanship yet they met the needs of the various age groups within the community. Children derived pleasure from the sounds produced by the jew's harp, whistles, and toy bull roarers, all of which were easily made from the leaves of plants. Adolescents expressed the yearnings of their age in the love songs played on simple bamboo flutes, while adults obtained a range of notes from the more carefully made Pan's pipes. Chiefs, as was their wont, maintained the distinction of class by monopolizing the sounding board.

Community needs in the dance were met by the mat bundle and bamboo rods, with which rhythmic sound produced by beating time was the essential factor. The material instruments had no special status and are thus being readily replaced by the empty benzine tin. Special craftsmanship expended its skill on the *nafa* gong. The gong stimulated emulation in the way of skill and introduced extra movements for the sake of display. The gong attracted the attention of the chiefs and was evidently on the way to join the sounding board as a class monopoly.

Before the advent of the *pate, lali,* and *longo* types of gongs, their functions of calling the community together must have been exercised by the *nafa*. It was a stationary instrument for the carrying of gongs in canoes is attributed

to the Tongans. The movable instrument for making announcements was the trumpet. The trumpet had high social status for it was associated with position, rank, and power. The *tautai* head fisherman coming in from the sea with a successful catch of shark, the travelling party grouped around a chief of rank, and the army of attack were all heralded by blasts of the trumpet. The trumpet called into activity the full resources of social organization and the village was galvanized into action that resulted in laughter or in tears.

The absence of the nose flute and the skin drum mark a gap in Samoan culture. Though the bamboo flute and Pan's pipes have now disappeared with their simple scale of Samoan instrumental music, it is interesting to note the survival of various sounding instruments which have been assigned new functions in the changing culture. The *pate* gong calls the children to school, the *pu* trumpet announces the edicts of the Government, and the loud boom of the *longo* calls the faithful to prayer. The instruments of a neolithic age are being exercised on behalf of the education, law, and religion of the new culture and the appeal is expressed in the forms of sound associated with the past which the Samoan people are called upon to forget.

WEAPONS

The weapons (*au'upenga*) of Samoa include clubs, spears, and slings.

CLUBS

The clubs are all wooden, cut in one piece out of the solid. The wood preferred was *pau*, but ironwood (*toa*) was also used, and in Tutuila, the *saitamu* was utilized. The clubs were originally cut out with stone adzes, but the early introduction of steel implements has probably resulted in some elaborate forms created for trade and ceremonial.

After being shaped, the clubs were rubbed smooth (*olo*) with *'ana*, a species of *nullipore* used as a pumice stone. A further polish was imparted by rubbing with a smooth stone or a shell.

The clubs consist of a number of types. The main characteristics and origins of the types may be best understood by following them through the initial stage of construction. After selecting and cutting his timber, the club maker adzes out the timber into the rough shape of the particular type. This must be of the maximum thickness and width of the particular club as edges, spikes, teeth, and all the individual characteristics have to be cut out of the solid for nothing is added or joined on. The first rough stage may be termed the structural foundation of the club.

The structural pattern. For certain types of club, the structural pattern already existed in the growing plant. A suitable sapling formed the foundation of the billet clubs and batons. The sapling dug up by the roots formed the foundation of the rootstock clubs, and particularly thick, expanded roots may have influenced an early form of mace and throwing club. After cutting off suitable lengths, the craftsman went on with the second stage of elaboration in whittling down the grip and dealing with the two ends.

For the clubs with a bigger head or a wider blade than a natural sapling could provide, the maximum sized timber had to be cut and adzed into the rough structural pattern before the second stage of elaboration could be proceeded with. The rough shape had to fulfill particular requirements and follow a certain plan for the various types. Each type of club thus had a particular structural pattern which, while providing scope for the elaboration of the type, also entailed certain limitations as to shape. The craftsman cut out his structural pattern according to plan, and the rough shape was associated in his mind with some natural object. He adzed it to that rough shape and in doing so expressed the process by using the word *fa'a* (made like or to the shape of). These structural patterns were made to the shape of the pandanus fruit (*aufala*), the coconut leaf stalk or midrib (*lapalapa*) the banana leaf (*laufa'i*), the paddle (*foe*), and the lobe of the ear (*lautalinga*). Whatever the idea that gave birth to a type, the first stage of construction followed one or other of the above structural shapes. Both the coconut stalk and

the paddle are evidently so old as motives that various types have been evolved from them with distinctive names. In the other three, however, the process of shaping is retained in the names of the club types as *fa'aaufala* (mace), *fa'alaufa'i* (bilateral toothed club), and *fa'alautalinga* (ear shaped club).

The head, or blade. The head of the mace, or of the throwing club is merely a larger section of the material and further treatment deals with cutting out spikes or rounding off the head. In the other clubs which are adzed down or split to provide the width to form a laterally expanded blade, one form of treatment in the rough shaping stage persists through all types of clubs. The coconut stalk, banana leaf, paddle, and ear lobes are bilateral with an equal spread outwards from the middle line. The blade is thickest in the median longitudinal line. With the timber or plank flat on the ground, the craftsman adzes the blade outward from the middle line with a slightly downward slope towards the lateral edges. On this side, there is, therefore, a distinct median longitudinal edge formed by the junction of two surfaces which are on different inclined planes. The plank is turned over, and the process repeated so that the blade is made much thinner at the lateral edges than in the middle line. This is ordinary craftsmanship to make the lateral edges thinner or even sharp so as to inflict an incised wound, and to strengthen the blade by keeping the middle part thick. The important point is that in all clubs the median longitudinal edge is the orthodox technique, and is not afterwards rounded off. If the occasional thick lateral edges which may form a narrow surface are omitted, the blade has four surfaces and is lozenge-shaped in cross section, the short diameter extending between the median longitudinal edges on either side, and the long diameter between the lateral edges. The term median longitudinal edge is used in preference to ridge, as ridge may convey the idea of a specially raised part which rises above the adjoining surfaces. The edge is distinct and characteristic, but it is merely the meeting of two surfaces. It may be exaggerated by making the surfaces slightly concave on either side, but is distinct from a carinated or raised ridge, which occurs in a few clubs as a specialization of the median edge.

From the occurrence of the median longitudinal edges on opposite sides of the clubs as orthodox technique it is seen that the craftsman followed the coconut stalk and paddle forms in general shape alone. The coconut stalk at the butt is transversely concave on its upper surface and convex on its lower. The Samoan paddle is transversely flat or slightly concave on its back and the median longitudinal edge of the front extends only a short distance down from the handle. Both coconut stalk and paddle clubs have a median longitudinal edge on either side extending to the far end of the blade.

Distal end of club. The treatment of the far end of the club is thus readily understood when the structural pattern of the club is known. Clubs derived from the coconut stalk pattern cannot have a functional point, whereas,

the clubs elaborated from the banana leaf or paddle patterns in the rough cannot well be without them.

The shaft is merely the continuation of the general shape in round billets, but in other clubs it narrows off the lateral expansions and median longitudinal edges to the round section of the grip.

The grip in all clubs is rounded to suit the grip of the hands. It is usually 1.3 inches in diameter, but in some, it may be slightly elliptical. The hypertrophic toothed and hook clubs are also thick in the grip. The Samoan clubs may have some narrow bands of carving round the grip, or a few narrow bands of sennit braid, each band consisting of not more than three turns of braid knotted to form rings. Most grips are perfectly plain. The close braid wrapping characteristic of Fijian clubs is not present. (See figure 306.)

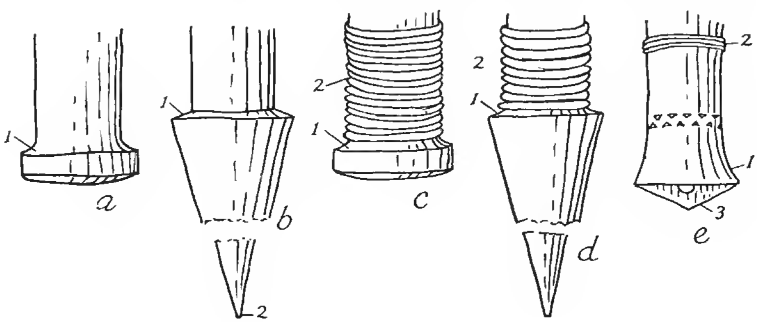


FIGURE 306.—Proximal ends, clubs—flanges and flaring: *a*, flange (1) characteristic of Fijian clubs, seen also in some Tongan clubs which show Fijian influence, also seen in a few clubs said to be Samoan, but which from the type are with little doubt Fijian; *b*, characteristic flange (1) of Niue club with proximal point (2) used for thrusting; *c*, Fijian flange (1) used to keep sennit wrapping (2) of grip from slipping over end; *d*, Niue flange (1) also used to prevent sennit wrapping (2) of grip from slipping; *e*, Samoan club with typical flaring (1); no sennit wrapping used but occasionally narrow bands of sennit braids (2); suspensory lug (3).

The proximal end of the handle is usually flared. The hook and tooth clubs and occasional odd clubs are of the same thickness at the end as at the grip. Fijian clubs are characterized by absence of flaring, the end being of the same diameter as the grip, but terminated by a distinct flange which forms what Churchill (5, p. 95) calls a flat cap. Churchill looked upon it as giving more security to the lower hand as well as supplying ornamentation. Churchill looked upon the Niue flange as being also for supporting the lower hand and the point as purely ornamental. As regards the Niue point, it was made primarily for thrusting. The use of the Niue weapons has been demonstrated personally to me in Niue. Though the larger ones are clumsy weapons, they resemble the New Zealand clubs in the principle of striking with the blade and thrusting with the point.

Flanges from both Niue and Fiji were made primarily not for supporting the lower hand but to prevent the sennit braid seizing of the grip, characteristic of the clubs of those areas, from working over the end of the handle. (See figure 306.)

The absence of the flange in true Samoan clubs is an important diagnostic point. Churchill stated that flanges were present in Samoan clubs, whereas the condition he meant to describe was flaring. A flange is a raised rim which expands outward at a sharp angle from the general surface and thus forms some support for strengthening or for attaching to something else as in the flanges of canoe planks or the Fijian weapon flange, which supports the braid wrapping round the grip. A flare, on the other hand, is a spreading outward of the general surface in a curve without any definite angle as in the ends of bark cloth beater handles and Samoan weapons. The flare gives support to the hand, but is not meant to support any structural addition. The absence of a flange and the absence of close seizing round the grip in Samoan clubs go together. The Samoan got support for his lower hand from the flaring of the handle end. The Fijian and Niuean got a firm grip for both hands from the sennit wrapping, though no doubt the flange also gave support.

The lug. After cutting out the characteristics of the club type, the Samoan made a lug at the end of the handle to carry a cord for hanging the weapon up. The lug is formed by cutting down the proximal end square with the long axis, but leaving a mesial piece ranging from 0.2 to 0.4 inches in thickness and projecting up to 0.8 inches. The projection was trimmed in a number of shapes. (See figure 307.)

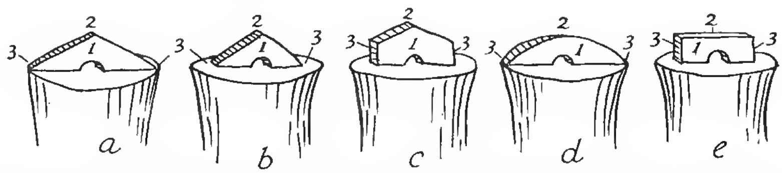


FIGURE 307.—Samoan clubs, proximal flared ends with types of suspensory lug: *a*, triangular lug (1) with apex (2) and sides of triangle extending to the edges (3) of the flared end and thus forming variety (*a*); *b*, triangular lug (1) with apex (2), sides not reaching flared edges but stopping short on end surface (3) and thus forming variety (*b*); *c*, pentagonal lug (1) with apex (2), sides cut down vertically to form extra sides (3) which do not reach flared edges; *d*, curved lug (1) with apex (2) rounded off and ends extending to flared edges (3); *e*, quadrangular lug (1) further stage of (*c*) with apex cut off to form a straight edge (2) above, sides (3) not reaching flared edge.

Even where the grip is perfectly round, the flared end is usually of two different diameters, the greater diameter generally following the transverse spread of the blade or head. The lug usually follows the greater diameter of the flared end. In some clubs owing to a prominent mesial longitudinal edge. on the blade, the greater diameter of the flare follows it and becames vertical.

Then the lug again usually follows the greater diameter. In quite a number of clubs, however, the plane of the lug does not follow the greater diameter of the flared end. No rule can be laid down, but the important feature is that the lug is usually present.

The hole is usually bored straight through the middle of the lug at its base. Churchill remarked in some of his clubs that the hole had been bored in from either side of the lug at a slope so as to meet in a V-shaped manner. In short clubs of the baton type, there is no lug and an attachment hole is bored transversely through the end of the handle from side to side, or diagonally from the proximal end surface through to the side. This sometimes occurs in larger clubs, especially as a secondary measure after the lug has been broken.

The cross rib. In shaping the structural pattern of certain clubs, the craftsman made the material thicker in certain parts. These were afterwards cut down into cross-ribs extending transversely, or obliquely across the blade from the middle line. Churchill (5, p. 57) states that the sennit tie round the base of the coconut leaf stalk used in club fighting is "susceptible" of being the source of the raised ribs in the coconut-stalk clubs. While lashings are capable of being represented on the club by bands of carving and perhaps a raised rib, the origin of the cross-ribs is much more likely to have arisen from technical methods. Some types of paddle clubs have the cross-rib as an essential part of their structure and yet there are no cross lashings in the original paddle motive. The cross-rib was much used by Samoan carpenters to strengthen wood that is purposely reduced in thickness to form a plank. It is used in the planks of plank canoes as a routine procedure, and even on the back of boards purposely made for use in scraping the paper mulberry bark. Hence the club maker, who was probably carpenter as well, could use spaced ribs to strengthen the blade of a coconut stalk club by simply falling back on the established methods of his craft. Besides strengthening the blade, the projecting ends of the cross ribs were a useful striking adjunct to reinforce the death dealing requirements of the blade edge. In paddle clubs, the cross rib was utilized to form a division between blade and shaft and the projecting ends again augmented the blade edge in certain types.

Very little detailed information regarding the names and uses of clubs was obtained in the field. Most of the old authentic clubs have disappeared from Samoa into private and museum collections. The study of weapons is thus a museum study which needs compiling and checking from the museums throughout the world. Museum collections again are much confused by containg clubs made for sale and clubs derived from private collections in which the true locality of the clubs is extremely doubtful. Clubs from Fiji and Tonga have been obtained in Samoa and add further confusion. Under the circumstances, the Bishop Museum collection of 50 clubs, which includes many models, has been augmented by the study of the types described by

Churchill, Kramer, and Edge-Partington. Churchill's work (5) is very exhaustive for the material described, but, while attributing a type to Samoa, no actual Samoan clubs are described. On the other hand, when not including Samoa in the province ("provenence") of a type, clubs of the type are described as coming from Samoa. Churchill's names of types have been retained whenever possible.

BILLET CLUBS

The *povai* is a billet of heavy wood which resembles an American baseball bat in appearance. There are two varieties, the round and the four-sided in cross section.

Round billet. In round billet clubs the distal ends are domed, some coming to a blunt point, and the greatest diameter is at the part where the head turns off to form the domed end (Pl. LI, 1 and 2). These clubs average in diameter about 2.7 inches at their head, diminishing to about 1.6 inches at the grip. The proximal ends are flared and furnished with lugs. Bands of carving encircle the clubs and are inlaid with coral lime. The club shown in Plate LI, 1 was used by King Malietoa in the war with Tamasese.

While the heads of most billet clubs are domed, Churchill (5, p. 21) describes a form cut off square. The shaft and grip though usually circular may be distinctly elliptical. The proximal end surface to which the lug is attached besides being usually cut square may in some clubs be slightly convex.

The four-sided billet has two sides narrower than the other two. (See Plate LI, 3). The widest part is distal where the curved end commences. The four surfaces of the head gradually narrow in a convex curve to form a blunt point. The club surfaces narrow gradually towards the shaft which is rounded and runs into the narrower grip. The proximal end is flared and provided with a lug. Bands of carving inlaid with lime form ornamentation.

ROOTSTOCK CLUBS

The rootstock club, so named by Churchill (5, p. 25), is a straight billet club but with the root of the sapling retained to form the head. The roots are cut off leaving short ends sticking out to form spikes. The type was restricted by Churchill to Tonga and Fiji where it is common. Edge-Partington (10, vol. 2, p. 41) figures an example in the Pitt Rivers Museum which is attributed to Samoa. It has the typical triangular lug at the end of a flared handle. The spikes, however, look as if cut out of the solid and the club may be intermediate between the rootstock and the usual type of mace. Kramer (18, vol. 2, p. 214) figures a similar club in Stuttgart which is labelled "Samoa," but which he looks upon as Fijian. If the rootstock type was known in Samoa, it was evidently rarely used.

MACE CLUBS

The mace clubs (Pl. LII, *A,* 10, 11) are related in form to the rootstock clubs but in making it the craftsman carved the solid wood to resemble the pandanus fruit with the spikes or knobs resembling the pandanus keys. Hence, structurally and in appearance, it became *fa'aaufala* (*fa'a,* made like; *aufala,* pandanus fruit).

Churchill (5, p. 52) gives the province of distribution as Fiji and then describes four clubs all from Samoa. Kramer (18, vol. 2, p. 210) figures three mace clubs from Samoa and Edge-Partington (10, vol. 2, p. 42, no. 3) figures one in the British Museum obtained from King Malietoa. The two figured in Plate LII, *A,* 10, 11 are in Bishop Museum.

The mace clubs include long two-handed and short one-handed varieties. Few of them exceed 30 inches in length, but Churchill describes two, each 40.5 inches long. Some clubs are wider at the proximal end of the head and others at the distal end. The short clubs may have the same diameter throughout the head or be slightly wider in the middle.

The Bishop Museum specimens were formed by cutting transverse grooves round the rounded head and then cutting longitudinal grooves at right angles to them. Each division was then trimmed into a cone with a blunt end. Some of Churchill's clubs had saw teeth and others sharp cones.

The Bishop Museum clubs are flared at the ends of the grips, the flaring being greater in one diameter. Each club has a perforated triangular lug made in the plane of the greater diameter of the flared end.

COCONUT STALK CLUBS

The coconut-stalk name used by Churchill (5, p. 56) is retained instead of using coconut leaf midrib which is meant. Mention has been made of the use of the actual coconut leaf midrib in the sport of club fighting. As the sporting form was used by skilled champions on ceremonial occasions of importance, it is natural that the coconut stalk became a structural pattern for weapons of hard wood to be used in real fighting. (See Plate LI, 7.)

The structural pattern was adzed out as already described with an expanded bilateral blade diminishing in width towards the proximal end where it ran into a rounded shaft. The technique of adzing from the middle line towards the side edges left median longitudinal edges, yet even here the influence of the coconut midrib pattern is apparent. The coconut midrib in the part used as a weapon has a marked convexity on one side while the other is concave merging into a flat surface. In cross section, the well made club in Plate LI, 7 does not form an even lozenge, but one surface is much flatter than the other.

The distal end is cut across to comply with the structural pattern. In most clubs, the end follows the pattern literally by being concave from side to

side, but it may form an obtuse angle or be straight. In a few clubs, the end may project outwards slightly in the middle line, a blunt angle being formed by the meeting of two straight lines. (See fig. 308, *b.*) The concave or blunt end of the coconut clubs is a distinct feature. The slight projection that sometimes occurs is never carried out to form a curved point such as occurs in some Tongan clubs with a tendency to a coconut stalk blade.

Ribs. In thick clubs, the lateral edges are correspondingly blunter, and in some, no attempt has been made to form a sharp edge. Such clubs are not so liable to nick at the edges. In clubs with thinner edges, the blade is strengthened by having raised ribs running across it at intervals. The ribs form wide bands raised above the general surface of the club and projecting at the side edges. A rib at the distal end is constant and widest, while the others diminish in width towards the shaft. The ribs may be left as plain raised bands (fig. 308, *c*) but they are more usually serrated by cutting parallel V-shaped grooves over their surfaces in line with the long axis of the ribs. The ribs are thus converted into a series of sharp-edged ridges crossing the blade and projecting beyond the lateral edges as sharp points corresponding to the number of ridges. The ribs not only strengthen the blade, but the projecting points improve the efficiency of the club as a weapon. The direction of the ribs conforms to the type of the distal end, which naturally influences the distal rib which bounds it. The other ribs take their direction from the distal one. With a straight distal end, the ribs are straight from side edge to side edge. With a concave or angled distal end encroaching inwards on the middle line, the distal rib has to follow suit and the grooving results in a series of chevrons with the apices directed proximally towards the handle. This is the commonest form. With the distal end projecting outwards in the middle line, the ribs also follow suit and chevrons are formed with their apices distal.

Subtypes. The treatment of the blade with, or without ribs, and the type of ribs results in four subtypes of coconut leaf club: *a,* without ribs; *b,* with straight ribs; *c,* with oblique ribs with the chevron apices proximal; *d,* with oblique ribs with the chevron apices distal. The types of distal ends and ribs are shown in figure 308.

In all subtypes, the flared handle and the perforated lug are constant features. When the lug is broken, an oblique hole may be bored through under the flared edge of the proximal end.

Variants. Kramer (18, vol. 2, p. 216) figures a club in which the oblique ribs alternate in direction. Edge-Partington (10, vol. 1, 69, no. 4) figures a curious club in which the slope of the coconut stalk distal end is repeated in a continuous series from the blade. Both variants are shown in figure 308.

The shaping of raised ribs by cutting away the wood between them is technically termed *tongi,* or *tongitongi.* Churchill (5, p. 56) gives the name

of the coconut stalk club as *lapalapa* which is the name of the coconut leaf midrib forming the structural pattern. In Savaii, the coconut stalk clubs with raised ribs are termed *uatongi* from the technique of carving the ribs. The term *lapalapa* applies to the plain subtype representing the original coconut stalk and *uatongi* to the later developed subtypes with ribs.

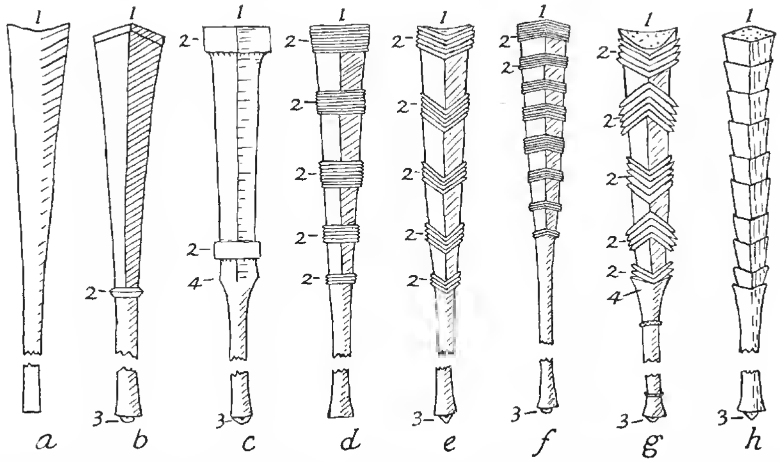


FIGURE 308.—Types of coconut stalk clubs: *a*, coconut stalk structural pattern, broad distal end (1) concave from side to side, blade diminishing gradually to shaft without any shoulder; *b*, coconut stalk club, subtype *a* without ribs on blade but one short rib (2) at junction with shaft, no shoulder, distal end (1) projects slightly outwards in the middle line, flared proximal end with suspensory lug (3); *c*, coconut stalk club in Bishop Museum (8934) subtype *b* with 2 straight ribs (2), one at distal end 5 inches wide, 2 inches thick in middle line, and 2.5 inches in depth; second smaller rib near proximal end; both ribs ungrooved, distal one carved with small triangles and proximal incised with parallel lines; distal end (1) straight and shoulders (4) a short distance below proximal rib; proximal end flared and with suspensory lug (3). Length of blade to shoulder, 21 inches; total length, 33.5 inches. *d*, Coconut stalk club in Bishop Museum (8697); subtype *b*, with straight ribs (2); distal end including rib, 4 inches wide, 1.5 inches thick in middle line and depth of rib, 2.9 inches; ribs five in number and all grooved to form points projecting 0.3 inch beyond lateral edge of blade; the number of ridged points in each rib commencing distally are 9, 9, 8, 5 and 3. Distal end (1) straight; proximal end flared but suspensory lug broken off. Length of blade to proximal rib, 19 inches; total length, 43.5 inches. *e*, Coconut stalk club, subtype *c* with chevron ribs with apices proximal (2), arranged in five bands; distal end (1) concave; proximal end flared with suspensory lug (3); no shoulder; width of distal end, 3.5 inches; thickness in middle line, 1.75 inches; length of blade, 19 inches; total length, 40.5 inches. *f*, Club of subtype *d* with chevron ribs with apices distal, figured by Edge-Partington (10, vol. 1, 71, No. 5); ribs, 8 in number, grooved. Distal end (1) conforms to distal rib with slight projection outwards. Proximal end flared and has suspensory lug (3). Length, 46 inches. *g*, Variant figured by Kramer (18, vol. 2, p. 216) in which the chevron ribs (2) alternate in direction of apices; shoulder (4) present; distal end (1), concave; proximal end flared and with suspensory lug (3); narrow bands of sennit braid spaced on handle. *h*, Aberrant form figured by Edge-Partington (10, vol. 1, 69, No. 4), with thick distal end (1) of coconut stalk pattern repeated in a continuous series; proximal end flared and with suspensory lug (3); length, 38.5 inches.

THE EIGHT-SPIKED CLUB

The eight-spiked club (*talavalu*), with four spikes on either side, must be clearly distinguished from the bilateral-toothed type with more than eight teeth on one side. No examples of the *talavalu* occur in Bishop Museum, but it is figured by Edge-Partington (10, vol. 1, 73, no. 3), Kramer (18, vol. 2, p. 213, Pl. 78 *b*), and Churchill (5, Pl. 3 *f*). The club is thus established in literature, but has been confused with the much more common bilateral-toothed type to which the name of *talavalu* has been wrongly applied.

The distal end of the eight-spiked club is wide and concave and has been aptly termed crutch-shaped by Churchill (5, p. 55). From the crutch-shaped end, the sides curve into the blade forming side projections which make the crutch-shaped appearance more marked.

The spikes. Four spikes, separated by distinct spaces, project from the blade on either side making eight in all, and thus giving the club the name of *talavalu* (eight spikes). In Churchill's club (fig. 309, *c*) the spikes range from 2.5 to 4 inches in width and the spaces between them range from 0.5 to 1 inch. The spikes were bevelled from their middle longitudinal line to sharpen their projecting side edges. The median longitudinal edge thus formed with each spike is carried on to meet the median longitudinal edges of the blade at right angles. The bevelling commenced on the spikes is carried inwards in decreasing depth until it disappears at the median longitudinal edge of the blade.

In the clubs figured by Churchill and Kramer, the proximal pair of spikes projected from the narrowing blade without any shoulder below them and Kramer's club was also crutch-shaped at the distal end. The presence of the crutch-shaped distal end with the absence of shoulders clearly indicate that the *talavalu* club was made from the coconut stalk structural pattern. Churchill (5, pp. 54, 55) saw the affinity of his club (fig. 309, *c*) to the coconut stalk pattern in the absence of a pointed head and proximal shoulder. The presence of the "crutch finish," he recognized as "characteristic of the coconut stalk clubs and in that connection is explicable structurally; the objection to such an ascription rests on the absence of serrate edges from that type; yet it might prove possible to discover intermediates which could connect the sparse teeth of this piece with an overdevelopment of the bands in such a club as 3 *J*."

The club 3 *J* referred to is a coconut stalk club with ribs. My Samoan informants in describing the ribbed coconut club (*uatongi*) stressed the fact that the ribs were serrated and projected beyond the edges of the blade. The natural sequence would appear to be that the plain ribs used to strengthen coconut stalk clubs became grooved and thus serrated on their lateral projections. The use of such serrations was carried a stage further by making *tala* spikes on a coconut stalk pattern with the spikes spaced in a manner similar

to the ribs of the earlier coconut stalk club derived from the coconut stalk pattern. The sequence may be followed in figure 309.

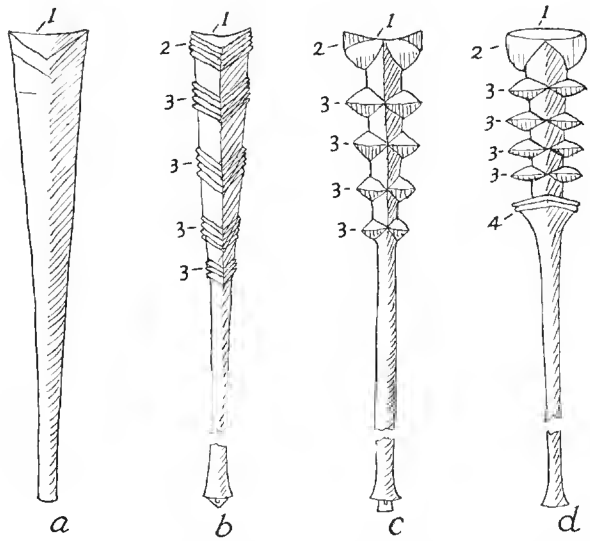


FIGURE 309.—Eight-spiked clubs (*talavalu*) with sequence from coconut stalk pattern: *a*, coconut stalk structural pattern with wide concave distal end (1) and blade narrowing to shaft without a shoulder. *b*, *Uatongi* coconut stalk club with spaced ribs (3) serrated and projecting in points beyond lateral edges; with wide concave distal end (2, 1) and no shoulder. *c*, *Talavalu* eight-spiked club figured by Churchill (5, Pl. 3, *f*), with crutch-shaped distal end (2); four pairs of spikes (3), spaced like the ribs of the coconut stalk club (*b*) and no shoulder; the crutch-shaped distal end and lack of shoulder establishes its origin from the coconut stalk pattern; total length, 34 inches. *d*, The *talavalu* aberrant form figured by Edge-Partington (10, vol. 1, 73, No. 3); distal end (1) straight but wide (2) and thus maintaining coconut stalk pattern; 4 pairs of spaced spikes (3) forming *talavalu;* distinct shoulder (4) with upper part grooved as in ribs of coconut stalk club (*uatongi*) thus making departure from structural pattern yet incorporating an element from the other type of club derived from the same structural pattern; length, 44 inches.

Name. Kramer's Samoan informant (18, vol. 2, p. 214) gave the meaning of *talavalu* as eight-spiked (*tala,* spike; *valu,* eight). He was undoubtedly referring to the true eight-spiked club described. Churchill (5, p. 54), who regarded the term *talavalu* as applying to the many-toothed club with a pointed end, questioned Kramer's interpretation of the term. As the interpretation of "eight-spiked" could not literally apply in number to the many-toothed type, Churchill interpreted the word *valu* as meaning "to scrape" or "to rasp" instead of "eight." He considered that Kramer's informant had rationalized the meaning of *talavalu* to explain an aberrant eight-spiked form, whereas it was Churchill himself, who, without knowing it, rationalized the meaning to suit the many-toothed club to which the name did not belong.

THE BILATERAL-TOOTHED CLUB

The bilateral-toothed club (*fa'alaufa'i*) has been confused in name with the *talavalu*. The distinction, both as regards name and characteristics, are marked. (See Plate LI, 4 and 9.) On making inquiries in Savaii regarding the *talavalu* club, based on Churchill's nomenclature, I was told that there was another club "like a *talavalu* but not a *talavalu*, called a *fa'alaufa'i*." On drawing a bilateral many-toothed club, it was pronounced to be a *fa'alaufa'i* and not a *talavalu*. A clear distinction exists as to three types of lateral projecting points; the *uatongi, tala,* and *nifo*. (See figure 310.)

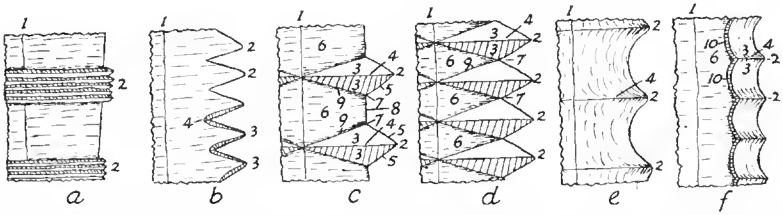


FIGURE 310.—Types of Samoan points, with Mariannas and Rarotonga points: *a*, *uatongi* raised rib of coconut stalk club projecting beyond lateral edge, and with divisions formed by grooves sharpened to form a serrated edge (2); the raised rib is continuous over the median longitudinal edge (1). *b*, Simple serrations of the lateral edges made by cutting nicks in the structural pattern; the point (2) shows the first stage of cutting the nick; the point (3) shows slight bevelling (4) which, however, does not meet the similar bevelling of the opposite side of the club and the side edges of the point are not sharpened; the slight bevelling is seen in the club (fig. 311, *b*); the bevelling is not developed enough to form median longitudinal edges on the individual points and there is an even plane from the median longitudinal edge (1) of the club to the points. *c*, Bevelled spikes of the *talavalu* clubs; the spikes (2) are bevelled (3) on either side of their median line (4) to sharpen their side edges (5) by meeting similar bevels on the opposite surface of the spikes; the median line of the spikes is thus converted into a median longitudinal edge (4) which is continued in to meet the median longitudinal edge (1) of the blade at right angles; the blade surface (6) is trimmed down from the median longitudinal edge (1) at an even slope to meet the deepest part of the spike bevelling at its junction (7) with the blade edge (8); the plane of blade bevel (6) meets the spike bevel (3) in a sharply defined angle (9) as both planes are straight; the bevelling of the spike (3) diminishes to nothing at the median longitudinal edge (1) of the blade. The features of the points is their separation by spaces which remain as portions of the edge (8) of the blade and leads to the spaced points being termed *tala* (spikes). *d*, Bevelled teeth of *fa'alaufa'i* club; the points (2) are bevelled on either side (3) which forms a median longitudinal edge (4) with each tooth; owing to the points being formed by continuous nicks as in the club (fig. 311, *b*), the bevelled sides of the points and the bevel (6) of the blade meet at a bevel point (7) with the result that there is no distinct blade edge between the teeth, as in (*c*); the close setting of the points has led to their being termed *nifo* (teeth) in distinction to the spaced *tala* of *c*. The meeting of the blade and teeth bevels forms bevel angles (9). The feature of the Samoan spikes and teeth is that their bevel surfaces are straight and meet the straight surface of the blade in distinct bevel angles. *e*, Curved points of a club from the Marianne Islands; the technique of forming the points (2) is by removing the intervening wood in such a way as to form concave surfaces on either side of the median lengitudinal line of the points. The concave surfaces from the adjoining sides of two points coalesce in one concave surface without forming any bevel angles. The concave surfaces on either side

form distinct median longitudinal edges (4) on each point, and the edge continues inwards to meet the median longitudinal edge (1) of the blade. The edge between the points is concave instead of angular as in the Samoan clubs. *f*, Curved points of a Rarotongan club; the curved technique leaves distinct median edges (4) between the concave bevels (3) of the points (2) and as in the preceding club the concave surfaces coalesce without any bevel angle. The curved bevel of the teeth are so inclined inwards that they end in inner curves (10) which are raised above the general plane (6) of the blade, which slopes outward from its own median edge (1).

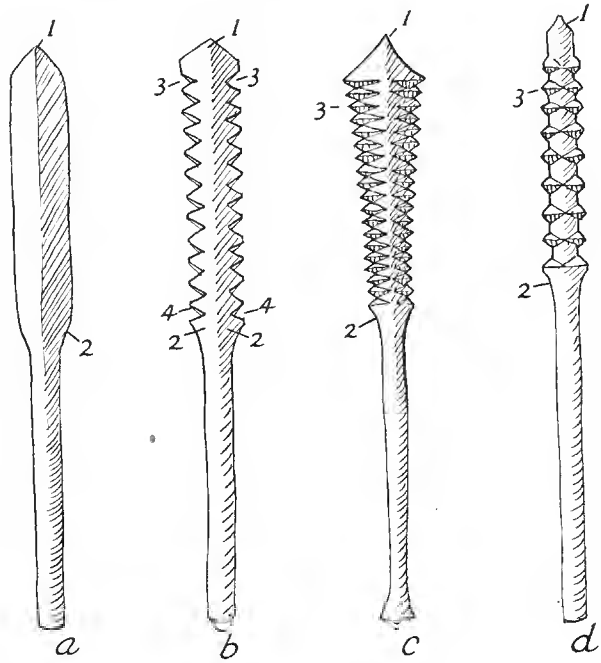


FIGURE 311.—Bilateral toothed clubs (*fa'alaufa'i*): *a*, Structural pattern likened to banana leaf (*laufa'i*), with end point (1) and shoulder (2), conforming to leaf pattern. *b*, Bilateral-toothed club in Bishop Museum (L. 1512); total length, 34.5 inches; blade length, 19.5 inches; width, distal end, 3.5 inches; thickness, 1.1 inches. The point (1) and shoulder (2) are defined as a result of cutting continuous V-shaped nicks from the first nick (3) to the lowest (4) on the sides of a structural pattern such as (*a*). The slight bevelling of the teeth does not meet to form sharp edges and hence does not necessitate bevelling of the blade. The proximal end is not flared but a curved lug without perforation is present. The club is thus unfinished and illustrates the simple type of teeth which must form the technical precursors of the bevelled teeth used in the more typical clubs. *c*, Model in Bishop Museum, with marked increase of width at distal end; the point (1) and shoulder (2) are present, with bevelled close-set teeth (3) forming bevelled angles; sides of distal point slightly concave. (See Plate LI, *A*, 4.) *d*, Aberrant form figured by Edge-Partington (9, vol. 1, 72, No. 2), made evidently from the banana leaf pattern with distal point (1) and shoulder (2) but with seven bevelled points (3) on either side spaced like the spikes of the *talavalu* club.

The teeth. From the Samoan distinctions given, the close points of the *fa'alaufa'i* will be referred to as teeth (*nifo*) and the spaced single points

correctly termed spikes (*tala*) confined to the *talavalu*. The characteristics of the bilateral-toothed club are a pointed distal end and a proximal shoulder with the intervening part of the blade on either side occupied by teeth set close together. Owing to the length of the blade being fully occupied by teeth, they number more than eight on either side. The fact that the close setting of the points constitutes them *nifo* (teeth) and not *tala* (spikes), together with their number being more than *valu* (eight), renders the club name of *tala valu* inapplicable to this type of club.

Structural pattern. The new features of a distal point and a proximal shoulder, so distinct from coconut stalk and eight-spiked clubs, is due to another structural pattern having been used in the manufacture of the type. The club name of *fa'alaufa'i* (*fa'a,* like; *lau,* leaf; *fa'i,* banana) indicates clearly that the structural pattern was likened to the banana leaf and figure 311 shows plainly how such a pattern accounts naturally for the special features of distal point and proximal shoulder.

Owing to the median longitudinal edges on either side of the blade, the point is pyramid-shaped, or forms what Churchill (5, p. 54) terms a pyramidion. (See Plate LI, 4.)

The drawing by Edge-Partington (10, vol. 1, 72, no. 2) of a club in the British Museum collection shows an aberrant form in which the interspike spacing of the *talavalu* is retained. (See figure 311, *d*.)

PADDLE CLUBS

Structural pattern. Theoretically speaking, Samoan paddle clubs should resemble Samoan canoe paddles. It has been seen, however, that the structural pattern of clubs, while following the general outline shape of the pattern motive, does not conform to it in cross section for technical reasons. Thus Samoan paddle clubs have a median longitudinal edge on either side that extends for the entire length of the blade. It has also been shown that the craftsman purposely leaves thick parts on the structural pattern to convert into cross-ribs if it suits him. The commonest form of paddle clubs are thus characterized by cross ribs which have arisen out of structural technique independent of the pattern motive.

In the coconut stalk and banana leaf structural patterns, the general outline conformed fairly closely to that of the original pattern motive. In the paddle structural pattern a departure takes place from the outline shape of the canoe paddle motive. In the canoe paddle, the greatest width of the blade is nearer the shaft than the point and the canoe paddle shape is ovate.

In the commonest types of Samoan paddle club, the greatest width of the actual blade is nearer the distal than the shaft end. The club blade is, therefore, not ovate like its original motive, but is obovate. Where the blade is too narrow to be termed obovate, the blade is oblanceolate instead of being lance-

olate. Thus in the "leaf form" of blade, the greatest width has deserted the position in the motive and gone forward. When the cross rib which defines the blade proximally, increases in width, the blade may tend to become "straight edged" instead of "leaf form." When the cross rib becomes extraordinarily lengthened, as in Fijian clubs, the whole appearance of blade and cross ribs is somewhat "halbert-shaped" or "hastate." Bearing in mind that the club maker is making a club instead of a canoe paddle, we can understand that a variety of forms and shapes may be made from a paddle structural pattern by the development of technique. What is lacking is a knowledge of the actual method of using each form of club, and how much use influenced the secondary shaping by the craftsman. The influence of diffusion can be indicated merely by the distribution of the various forms in the neighboring Tongan and Fijiian areas.

The paddle motive. The question is, did the Samoan craftsman recognize the paddle as a motive for a structural pattern, or are we merely attributing to him what we think? At Safotu in Savaii, I was told by the talking chief Mamea that a paddle shaped club (*amuamu*) made of *ifilele* wood was in great favor at Fangaloa in Upolu. He chanted the song of the paddle club as follows:

"Aumaia e—, Aumaia o—.	"Let them come—let them come.
Ali'i e, fa'asili lau moe,	O chief, rest in untroubled sleep,
Ou te olo isi a'u foe!	For I am rubbing down my paddles!
Aue—saulu alo e—.	Alas . . . .
Aumaia e—, Aumaia o—."	Let them come—let them come.

The significance of the chant is in the third line.

The chant was that of the *amuamu* club, but the objects that the chanter was rubbing down (*olo*) were in the structural pattern form of a paddle (*foe*). Unfortunately the subject could not be followed up at Fangaloa itself, but the chant shows that club makers recognized the paddle as a structural pattern for clubs.

Types. There being no full sized clubs available, a selection of various forms attributed to Samoa are reproduced (fig. 312) from Edge-Partington (10, vol. 1, 70, 72) for analysis into types.

Churchill (5, p. 63) divided paddle clubs into two forms according as they were with or without a cross rib. He further distinguished *carinated* and *serrated* clubs as two types distinct from paddle clubs. Until more study material is available, it is proposed to group all clubs derived from the paddle structural pattern under the heading of paddle clubs.

Such clubs may be divided into four types: 1, without cross ribs; 2. with short cross ribs; 3. with medium length cross ribs; 4. with wide cross ribs.

Paddle clubs without cross ribs. This is a theoretical group as regards Samoa based on the idea that the structural pattern might be retained without the addition of a crossbar. Churchill's descriptive material of this type consisted of 17 clubs from Tonga and none from Samoa. Neither Edge-Partington nor Kramer figured a specimen of the type and there is none in Bishop Museum. The original structure pattern if ever used as a completed club was either totally displaced by the ribbed forms or is extremely rare.

Paddle clubs with short cross ribs. The cross rib is situated at the junction of the blade and the shaft. The rib merely defines the commencement of the blade where it diverges outwards from the shaft. The rib is so short that it merely form a rim (fig. 312, *c*) and there is thus no necessity for a proximal shoulder. In the type (fig. 312, *b*) which is doubtful, the rib is widened longitudinally. Again, while Churchill (5, p. 62) includes the type in the Samoan area, his material was all from Tonga. Kramer does not figure any examples and our own material is lacking. Edge-Partington shows four (fig. 312, *a*, *b*, *c*, and *d*) clubs which may be regarded as belonging to it, but two (*a* and *b*) are probably from Tonga in spite of the labelling. The second type of paddle club is thus not particularly available. The distinguishing feature is that owing to the shortness of the rib, there is no proximal shoulder and the blade spreads outward from the rib. The blade shape is obovate or oblanceolate.

Paddle clubs with medium cross ribs. The effect of lengthening the cross bar immediately affects the shape of the blade. While in the structural pattern, the thickening for the rib must be left across some part of the blade, the effect of the rib in the subsequent shaping is to limit the weapon blade to the part beyond it whilst the part on the proximal side becomes a shoulder connecting the cross rib with the shaft of the club. The width of the cross rib influences the width of the blade and its consequent shape into two main varieties.

Narrower leaf-shaped blade (Plate LII, *A*, 1). The medium width across rib is shown in figure 312 *e* and *f*. From the cross rib which defines the blade, the blade slopes inward and then gradually outward to form the "leaf shaped" blade so characteristic of the ancient Greek swords. The shape is oblanceolate, but in some, the greatest width is near the middle of the blade and gives it a somewhat elliptical form. Figure 312 *f* is carinated.

With wider straight edged blade (Plate LII, *A*, 2). The wider cross rib and blade is shown in figure 312 *g* after Edge-Partington (10, vol. 1, p. 72, No. 4). The blade is practically as wide as the cross rib and there is only the slightest inward slope from the cross rib. The blade in consequence, is nearly straight edged. The other example (fig. 312 *h*) after Kramer (18, vol. 2, Pl. 77 *e*) is carinated, and the straight edges spring at once from the

crossbar. In many of this type, there is a slight curve in the sides of the blade, but not so marked as in the leaf form.

In some clubs, the surface on either side of the middle line is cut down before being slanted outwards. This converts the median longitudinal edge into a carinated ridge. The carinated ridge is confined to the blade and is not continued on the proximal side of the cross rib. Churchill seems to have included all clubs of type 3 under the term of carinated clubs which he regarded as a purely Samoan development. The strictly carinated clubs (fig. 312 *f* and *h*) are merely an accentuation of one feature and are best regarded as a variety of type 3, as "carinated" cannot well be applied to the clubs of the same type, but with no carinated ridge.

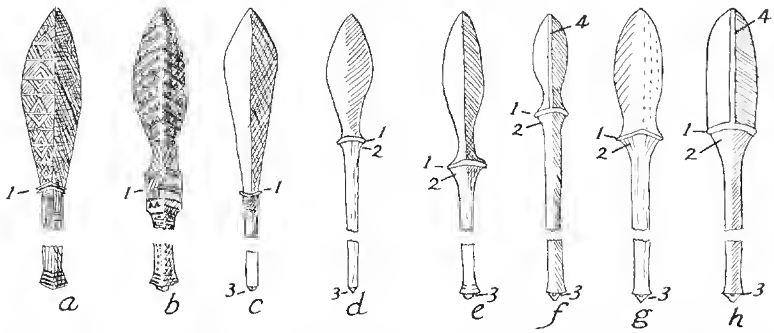


FIGURE 312.—Paddle clubs (types 2 and 3): *a-g*, from Edge-Partington (10, vol. 1), the plate and number being given with each club figured; *h*, from Kramer: *a*, (70, No. 5): paddle club (type 2) with short rib (1) at junction of blade and shaft; length, 48 inches. The elaborate carving of the blade and shaft, with the type of proximal end, creates a strong suspicion that the club is Tongan instead of Samoan. *b*, (70, No. 4). Paddle club (type 2) with rib (1) prolonged longitudinally at shaft junction and blade curving inwards beyond rib; length, 44 inches. The elaborate carving of blade and shaft is probably Tongan. *c*, (70, No. 6). Paddle club (type 2) with long oblanceolate, uncarved blade and short rib (1) without shoulder. Suspensory lug (3) present; length, 47 inches. *d*, (72, No. 1). Paddle club, intermediate between types 2 and 3. The rib (1) is fairly short but yet long enough to create a shoulder (2) on its proximal side. The blade has a concave-convex curve and a suspensory lug (3) is present. Length, 45 inches. *e*, (70, No. 3). Paddle club (type 3) with medium rib (1) and shoulder (2); the blade is leaf shaped with a concave-convex curve; the proximal end is flared and has a suspensory lug (3). Length, 46.5 inches. *f*, (72, No. 5). Paddle club (type 3) with medium rib (1) and shoulder (2); the leaf shaped blade is carinated (4); flared end with suspensory lug (3); length, 46 inches. *g*, (72, No. 4). Paddle club (type 3) with wider rib (1) forming a chevron with the apex distal and marked shoulder (2); wide blade with slight concave curve beyond the rib making the blade almost "straight edged"; flared proximal end with suspensory lug (3); length, 42 inches. *h*, After Kramer (18, vol. 2, Pl. 77, *c*). Paddle club (type 3) with wide rib (1), marked shoulder (2) and wide straight edge blade which is carinated (4); flared proximal end with suspensory lug (3).

Edge-Partington (10, vol. 1, p. 72, No. 3) figures a club (fig. 313 *a*) which shows a leaf form blade springing from a wide shoulder a little internal to the outer margins. He (10, vol. 1, p. 70, No. 2) also shows another club

(fig. 313 *b*) in which the point has evidently been broken off and the club trimmed with two points.

Churchill (5, p. 71) described 6 full sized Samoan clubs of this type, and a summary of measurements is as follows:

Total length—40.5 to 47 inches.

Blade length—12 to 16 inches.

Greatest width—3.75 to 6.5 inches.

Thickness—1.0 to 2.0 inches.

The maximum width in Churchill's series was at the cross rib.

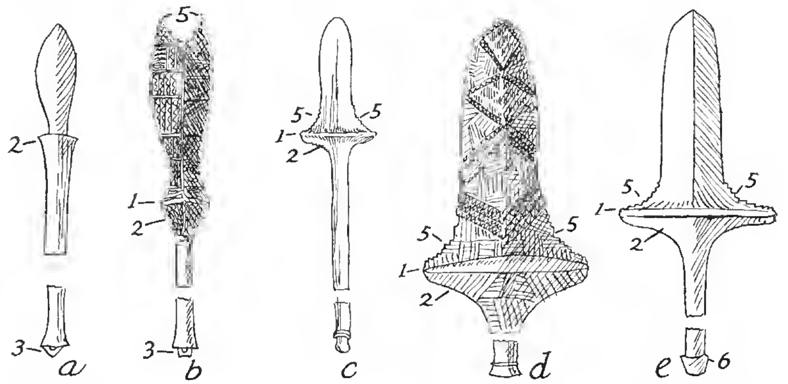


FIGURE 313.—Paddle clubs (types 3 and 4): *a*, after Edge-Partington (10, vol. 1, 72, No. 3). Paddle club (type 3) abberant form with leaf shaped blade forming sharp angles with wide shaft shoulder (2) without rib; flared proximal end with suspensory lug (3); length, 49 inches. *b*, After Edge-Partington (10, vol. 1, 70, No. 2). Paddle club, aberrant form of type 3, with medium rib (1) and shoulder (2); carved blade with bifurcated distal end probably due to broken single point being subsequently trimmed to two points (5); length, 34 inches. Though the club has a flared proximal end with a suspensory lug (3), its resemblance in carving to the clubs (fig. 312, *a* and *b*) creates the impression that it is wrongly labelled as Samoan. *c*, After Churchill (5, Pl. I, *e*). Fijian paddle club (type 4) with wide rib (1), distinct shoulder (2) and halbert shaped blade with serrations (5) on its proximal end; knob shaped proximal end. *d*, Fijian paddle club (type 4) with wide rib (1), shoulder (2) and serrations (5) on proximal end of halbert shaped blade; blade elaborately carved with plaiting and triangle motifs; proximal end flared but no suspensory lug. *e*, After Kramer (18, vol. 2, Pl. 74, *g*). Paddle ciub (type 4) with wide rib (1), shoulder (2) and serrations (5) on proximal end of halbert shaped blade; the proximal end has the typical Fijian flange (6). The club is in the Stuttgart Museum and is labelled "Samoa" but is undoubtedly Fijian.

Paddle clubs with very wide cross ribs. This division includes the type termed serrated clubs by Churchill. Though he includes Samoa in its distribution, his series of 10 clubs were all from Fiji except a doubtful form attributed to Samoa, which had the typical Fijian flat cap flange at the end of the handle. Kramer (18, vol: 2, pl. 74 *g*) figures one in the Stuttgart Museum, but the carving and handle end are evidently Fijian while another with a "Samoa" label (18, vol. 2, pl. 79, *b*) he relegates to Fiji. Edge-Part-

ington does not figure the type for Samoa. It is evident that the type does not belong to Samoa.

The range of measurements of Churchill's Fijian series is summarized below for comparison with the Samoan paddle type 3.

Total length—36 to 53 inches.

Blade length—11 to 26 inches.

Cross rib length—25 to 30.5 inches.

Blade width—6 to 13.75 inches.

Thickness—0.75 to 1.75 inches.

The extraordinary lengthening of the cross rib is seen. The widest cross rib in Type 3 was 6.5 inches and the shortest in Type 4 is 25 inches, practically four times as long. The club in the Stuttgart Museum figured by Kramer as labelled "Samoa" is shown in figure 313 *e*. In the absence of authentic examples from Samoa, the very appearance of the club shows it to be outside the range of thought of the Samoan club maker. Two of the Fijian clubs are shown in figure 313 *c*, and *d*.

In summing up, it may be said that the Samoans specialized on the paddle club of Type 3. It evidently became a favorite club type with the warrior and hence with the club maker. Owing to their specialization, Type 1, if ever used as a weapon, disappeared, Type 2 was being displaced, and Type 4 was never evolved locally or adopted from Fiji by Samoan craftsmen.

THE EAR-SHAPED, OR MUSHROOM CLUB

Structural pattern. The clubs shown in Plate LII, *A*, 4-6 are termed *fa'alautalinga* (*fa'a*, shaped like; *lautalinga*, a toadstool, or the lobe of the ear). Churchill has accepted the toadstool meaning of *lautalinga* and hence termed the type mushroom clubs. Looking at the matter from the point of view of the craftsman's structural pattern and the object to which he compared it, the toadstool is much less likely to form the name motive than the lobe of the ear. The toadstool I never saw or heard of during my sojourn in Samoa, but the ear is always present and frequently referred to. The craftsman in adzing out his structural pattern shaped it like two ears placed together, as the club was bilateral, and with the lobes forming the curve to the external angles.

Three clubs, selected from the eight weapons in Bishop Museum (Pl. LII, *A*, 4-6) show the varieties. (See fig. 314.) The length of the head is from the level of the external angles or lobes to the distal end. The proximal thickness is also taken from this point.

From the figure, the shorter length is apparent for the clubs are full sized weapons. The head increases in thickness to the distal end, which in one club is 2.4 inches. The surfaces of the club are sloped outwards from the middle line so as to form a marked longitudinal edge which becomes more

prominent as the head thickens, for the surfaces are then made with a concavity. The end transverse curved edge ends at the proximal widest part of the head. From these points, the head curves inward towards the middle line from either side sharply to form external angles and then slopes gradually back to form an expanded shaft which narrows to the grip. Sometimes the lateral curves may be so marked as to give the external angles a hook-like appearance. The actual edge of the long end curve is the full thickness of the club in the middle line, but narrows gradually out towards the external angles. There has never been any attempt made to bevel down the edge to a sharp cutting edge. The club is evidently intended as a close striking club which depends on weight and not keenness of cutting edge. The grips are

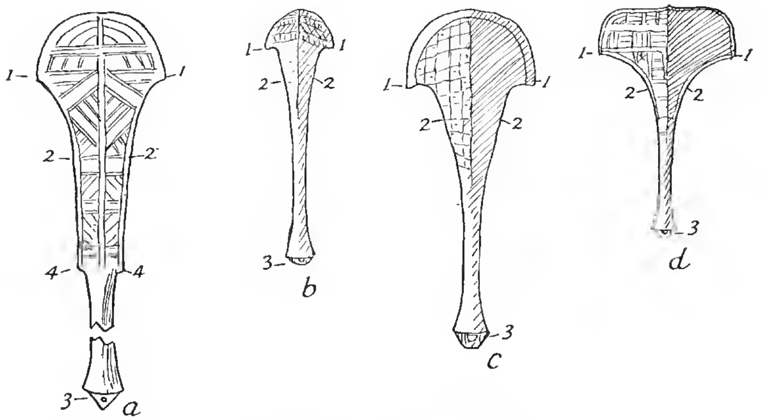


FIGURE 314.—Types of ear shaped clubs (*fa'alautalinga*): a, Aberrant form of ear-shaped club with typical angles (1) which slope in to an expanded blade (2) ending in shoulder (4); the proximal end is flared and has a suspensory lug (3) length, 46 inches. The club is in the Pitt Rivers Museum, Oxford, and is figured by Edge-Partington (10, vol. 2, 41, No. 2). It may be the precursor of the shorter clubs. *b*, Variety *a*; short light form with narrow head; used with one hand. (See Plate LII, *A*, 4). *c*, Variety *b*, even semicircular head, heavy, used with two hands. (See Plate LII, *A*, 5). *d*, Variety c, flattened end curve, almost rectangular appearance. (See Plate LII, *A*, 6.) The clubs (*b*, *c* and *d*) have all got well marked external angles (1), from which the shape (2) converges to the shaft while the proximal ends are all flared and have suspensory lugs (3).

TABLE OF MEASUREMENTS (IN INCHES)

	b	*c*	*d*
Length	24.	26.5	22.5
Head length	3.4	6.4	4.4
Head width	6.3	10.75	11.75
Head prox. thickness	1.3	1.6	2.
Head distal thickness	1.8	1.8	2.4
Grip, transverse diameter	1.4	1.6	1.45
Grip, vertical diameter	1.2	1.5	1.5
Handle end, transverse	2.1	2.5	1.9
Handle end, vertical	2.0	2.1	2.2

thicker than usual and the flared proximal ends are provided with lugs. The wide lateral expansion of the head affects the grip which is wider in the transverse diameter than in the vertical except in the club where the pronounced median longitudinal edge is carried down on the shaft and though rounded off on the grip, the vertical diameter of both grip and flared end is greater than the transverse. The three varieties of the type may be summarized as follows: *a,* narrow head and lighter made to serve as a single handed club. (See Plate LII, *A*, 4; figure 314 *b.*) b, Even semicircular curved head made heavy for use with both hands. (See Plate LII, *A,* 5; figure 314 *c.*) *c*, Flattened end curve giving almost a rectangular appearance. (See Plate LII, *A*, 6; figure 314 *d.*)

Edge-Partington (10, vol. 2, p. 41, No. 2) figures a club 46 inches long in the Pitt-Rivers Museum. (See figure 314, *a*). This aberrant form shows an ear-shaped head with the lateral curves prolonged proximally to form a blade somewhat like a coconut stalk club. The ear-shaped club is a specialized short club which is more likely to have sprung from a long type of club than to have commenced short. The origin of the type from a long club seems further supported by the fact that it is made from a split plank and not from a round sapling or bough like the knobbed clubs and the maces.

All the clubs are carved on the head and the lateral expansions from the shaft.

THE UNILATERAL-TOOTHED AND HOOK CLUBS

The *nifo'oti* club is marked by a row of teeth on one side which are of the bevelled type seen in the bilateral-toothed clubs. The close set bevelled teeth of the *nifo'oti* club give it its name (*nifo,* teeth; *'oti,* to cut). The toothed side of the *nifo'oti* club has little to distinguish it from the side of a *fa'alaufa'i* club, except that the teeth are longer and, owing to the *nifo'oti* club being much thicker in the median longitudinal line, there is a concave slope from the middle line to the points of the teeth. In the type figured (Pl. LI, 8) there is a slight space between the individual teeth. The bevel, however, of the sides of the teeth, and from the middle longitudinal edge of the blade are the same as described. Owing to the greater thickness and length of the teeth, they are more spiked in appearance, whereas the *fa'alaufa'i* teeth are flatter and more saw-like. As in the *fa'alaufa'i,* the toothed side has a proximal shoulder of the same nature. Beyond the distal tooth, the blade, after sharing in the tooth bevelling on the proximal side, is brought back square to the middle line. It is simply a tooth sharpened on the proximal side only.

The other side of the club is laterally expanded as if to provide another set of teeth which, however, are never made in the orthodox club. The distal end is further expanded as if forming one side of the head of an ear-shaped

club. The external angle or lobe seen in the ear-shaped club is prolonged proximally and the tendency to form a hook is here deliberately converted into one by carrying the short curve between the external angle and the blade back into the head. The club is thus unilaterally toothed with a hook on the other side.

The 5 *nifo'oti* clubs in Bishop Museum, of which some are small, all share the clumsy proportions of the type club and all are without suspensory lugs.

The *nifo'oti* is thus a hybrid compounded from other clubs. The toothed side may be regarded as a *fa'alaufa'i* club with the distal point cut off, or a coconut stalk club with the side cut into teeth. The untoothed side is a coconut stalk club with the distal end adopted from the ear-shaped clubs and the external angle exaggerated into a hook. Three well-shaped hybrid clubs; one figured by Edge-Partington (10, vol. 1, 73, No. 5); one by Kramer (18, vol. 2, p. 211, fig. 16 *a*); and one in Bishop Museum, indicate that the pattern from which the *nifo'oti* has been derived is more probably the coconut stalk than the banana leaf, and that the proximal shoulders have been due to the wider expansion of the blade to provide bevelled teeth. (See figure 315.)

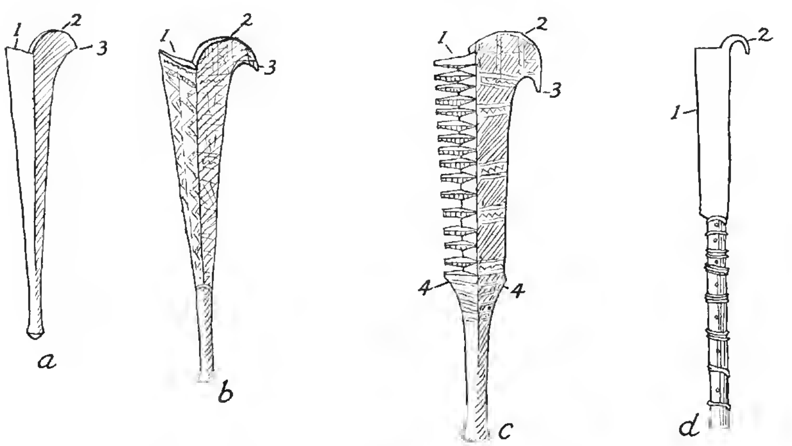


FIGURE 315.—Unilateral toothed and hook club (*nifo'oti*) with probable precursors: *a*, Hybrid club in Bishop Museum; the left side is of the typical coconut stalk pattern with a wide distal end (1); the right side is also of the coconut stalk pattern but has a distal end (2) showing affinity with the ear-shaped clubs but the angle (3) is not so marked; no shoulder; the proximal end is flared and has a suspensory lug; length, 24.25 inches. *b*, Hybrid club figured by Edge-Partington; the blade has the coconut stalk pattern with the typical distal end (1) on the left and the ear-shaped form (2) on the right with the angle (3) more hook like than *a*; no shoulder; lower end flared; blade carved; length, 24.5 inches. *c*, A *nifo'oti* club, with left side cut into bevelled teeth and distal end (1) cut square; the right side is without teeth and the distal end (2) is typically ear-shaped with the angle (3) more concave on the inner side to form a hook; the wide blade results in shoulders (4) being formed at the shaft junctions; thick clumsy weapon, slight flaring, no suspensory lug; length, 40 inches. *d*, Modern steel *nifo'oti*, with cutting edge (1) and distal hook (2) on the right.

Kramer (18, vol. 2, p. 216) figures a club with bevelled teeth on both sides and a similar bilateral-toothed club is in Bishop Museum.

A more modern development is the steel bladed weapon with a marked hook. (See figure 315 *d*.) This weapon formed the favorite club in the modern Samoan wars and also received the name of *nifo'oti*. Churchill (5, p. 79) states that it is simply the blubber knife of the whalers.

In discussing the significance of the term *nifo'oti,* Churchill (5, p. 78) quotes Kramer as stating that the hook on the club was used for the purpose of dragging corpses out from the heap of slain after which the head was sawn off with the teeth assisted by a stone axe. The hook was thus termed *nifo-oti* (*nifo,* teeth; *oti,* dead), but closer examination resolved the name into *nifo'oti* (*nifo,* horn; *'oti,* goat), from the resemblance of the hook to a goat's horn. Churchill objected to the term *nifo-oti* being translated as "tooth of the dead," for, from a linguistic standpoint it would mean dead tooth. The "goat's horn" meaning, he also rejected as being too modern and implying that the weapon had no name before the introduction of goats. He takes *'oti* as meaning "to cut," and *nifo'oti* as being applied to the teeth (*nifo*) with which the head was cut off (*'oti*). The function of the hook as given by Churchill agrees with my own information, that the head was cut off and the successful warrior carried the trophy home on the hook.

The hybrid nature of the club indicates that the *nifo'oti* club is a later development than the three established clubs from which it derived elements of form. The hypertrophied form without distinct proximal flaring and suspensory lugs together with its clumsy nature and lack of balance, all point to the ceremonial usage which accompanies the display of peace rather than the utility of war. The ear-shaped clubs and the composite ear-shaped and coconut stalk clubs (fig. 315, *a* and *b*) could both be used in warfare with good results. The exaggerated wooden *nifo'oti* club would be a misfortune to any warrior who had to use it in actual combat. Until well-balanced wooden *nifo'oti* with distinct hooks that were used in war before the advent of the blubber knife, can be described, the club must be regarded as a fairly modern development made for show purposes. The natural sequence would appear to be that hybrid clubs of the type depicted in figure 315, *a* and *b,* were toothed on one side and were termed *nifo'oti* from the fact that the teeth could inflict a cut. The cutting off of heads was beyond the scope of such a club and there was no incentive to produce the angle of the ear-shaped end into a hook. The advent of the blubber knife, however, provided not only an edge to sever the head, but a ready-made hook to carry it away. The hook carrying idea having been supplied, the angle of the ear-shaped end of the *nifo'oti* was shaped to form a hook. Through the hook motive, the wooden club then reacted on the steel weapon and provided it with the name of *nifo'oti,* although it had no cutting teeth (*nifo'oti*). The blubber knife became the functional

nifo'oti used in war and the wooden *nifo'oti* underwent the hypertrophy associated with the ceremonial observances of peace.

DOUBTFUL CLUBS

The club with the long lozenge-shaped blade (Pl. LI, 5) and five bilateral pairs of spikes at the junction of the blade with the shaft was collected by myself in Samoa. Others were seen and are used in dances. The name of *anave* was given but the type seems new and as if introduced.

A club with a longer narrower blade, without spikes, but with two narrow transverse raised bands with serrated edges is catalogued as Samoan in Bishop Museum, but it is extremely doubtful if it belongs to that area. (See Plate LI, 6.)

SHORT CLUBS

Maces. The short mace (Pl. LII, 11) has already been described on page 589.

Batons or short billets were used as single-handed weapons. The one in Plate LII, *A*, 7 is old and well polished. The specimen in Plate LII, *A*, 8 is thicker and has had sennit braid wrapped in loose spirals round the grip. It has a piece projecting from the proximal end that was too narrow to pierce with the ordinary sized hole. Both batons have a large hole bored transversely through the handle for the supporting cord.

Knobbed throwing club (*'olo*). The knobbed throwing club was described by Churchill (5, p. 32) for Fiji without including Samoa, but Kramer (18, vol. 2, p. 210, *q*) figures one from Samoa and the club in Bishop Museum (Pl. LII, *A*, 9) is also from Samoa. The Samoans call the club *'olo* and it was evidently well known. The club was thrown with the handle in the hand but as it went forward, the ends reversed and the object was struck by the end of the handle. The club figured has four bands of carving round the handle and shaft. The handle increases in diameter towards the proximal end without marked flaring. The knobbed head is smooth and the distal end projects as if the handle had been inserted through the knob and projected beyond it for 0.2 inches. The proximal end of the handle is domed.

SPEARS

Spears (*tao*) were made of *pau* wood and also of mature coconut wood. They were scraped, polished, and oiled. The long spears were usually from 9 to 10 feet long. Shorter spears of 6 to 7 feet were also used as staves which could be converted into weapons of offense or defense. The general name for spear is *tao*. A chief's spear or staff was called *uai*. A short spear used as a staff could be referred to as *to'oto'o*.

The spears were made in one piece including barbs. Barbs are termed *tala*. One end only was pointed, the other end being blunt and without any differentiation into grip or counterpoise.

Barbless spears. Some spears were merely scraped to a point and hence termed *tao valu fua* (*valu*, scraped; *fua*, alone). Here *fua* means without barbs. Pratt (23, p. 35) gives *ato* as a stick sharpened at both ends and used in ancient times as a spear. This is the exception to the usual one pointed spears.

Barbed spears. The barbs noted may be divided into simple and compound barbs.

The simple barbs are made by cutting nicks in the head of the spear as in figure 316, *a*. In this form, the head is shaped to form a projecting longitudinal edge in which nicks are cut with a forward obliquity. The type of barb is present in the spear in Pl. LII, *B*, 3, which comes from Malaeloa, Tutuila, where it was called *fa'atala lau paongo* (made like the spikes of *paongo* pandanus leaf). The longitudinal sharp edge on which the barbs are cut is prolonged forward towards the point. The spear was used as an orator's staff and hence called *to 'oto'o fa'atala lau paongo*. The barbs are on one side only of the head.

Another type of simple barb is made projecting out from the head and usually with a curve backward. This type restricted to one side of the head is shown in figure 316 *b*.

The simple barbs may be arranged in transverse rows around the head. The spear in Plate LII, *B*, 1 has long backward curved barbs arranged in three longitudinal rows and in transverse rows of threes. To get this formation the head is cut out of the solid in triangular form in section. The points of the longitudinal rows thus coincide with the longitudinal edges and the intervening material is cut away. Towards the point of the spear in Plate LII, *B*, 2 the barbs are arranged in four longitudinal rows and in transverse rows of four. Here the spear head is cut out in quadrangular shape and the angles correspond with the points of the barbs. Where the diameter decreases towards the point of the spear, the barbs are short with the usual backward obliquity. If made further back on the head, the barbs become longer and curved. The point beyond the last barbs usually maintains the triangular or quadrangular character of the head until it rounds off into the actual terminal point.

While the barbs are sloped backward to render penetration easier and extraction more difficult some of the furthest back barbs, as in the proximal end of the head in Pl. LII, *B*, 2 may be directed forward.

The compound barbs in Samoan spears consist of three points with their bases together and all cut out of the solid. The middle element of the three

stands out vertically from the head of the spear, while of the other two, which are on either side in the longitudinal line, the distal one is directed obliquely forward and the proximal one, obliquely backward. These three-point barbs termed *tala-o-le-lo* (spine of the *lo* fish) are generally arranged in three or four longitudinal rows and also in transverse rows. Again the spear head is cut triangular or quadrangular and the points are formed on the angles by cutting out the intervening material. Sometimes the simple and compound barbs are intermixed. Even the spears in which the compound barb is the main theme are furnished with simpler barbs towards the point as the thickness of the head diminishes. The compound barbed point gives its name of *tala-o-le-lo* to the spear itself and such spears are the most prized. They were made out of both *pau* and coconut wood. (See Plate LII, *B*, 2.)

The elements of the compound barb are triangular in shape with the bases attached to the head end and the apices forming the free points. (See figure 316, *c*.) The fore and aft elements have median longitudinal edges which made the barbs lozenge-shaped in cross section.

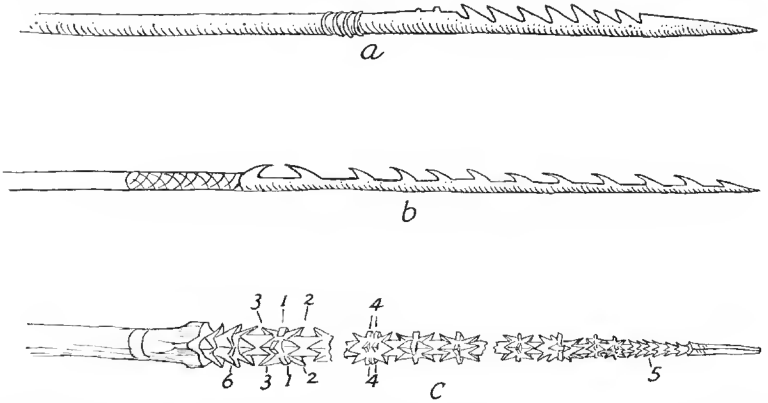


FIGURE 316.—Spears (*tao*); types of barbs: *a*, simple barbs, formed by cutting nicks in a raised longitudinal edge. *b*, Simple barbs with a backward curve. *c*, Compound barb (*tala-o-le-lo*) composed of three points; a middle vertical point (1), a forward projecting point (2) and a backward projecting point (3); the middle points are sometimes in pairs (4); the compound points are arranged in 4 rows longitudinally; simple backward projecting points (5) towards point of spear and simple forward projecting points (6) on proximal end of the barbed part.

SLINGS

Slings (*ma'ata*) were extensively used but no information was obtained as to technique except that they were made of the bast of *fau* or *fau songa*. The sling stones were not worked but were selected from waterworn pebbles (*ala*) of appropriate size. Some stones (*ala papa*) were said to burst on striking. At Fitiuta, Tau, the waterworn stones from the Laufiti stream, five miles distant, were in much favor as sling stones. Before hostilities men

were sent to the stream to bring back loads of stones as ammunition. The sling was looked upon as a very effective weapon in war. The wounds inflicted were severe and any arms or legs that were broken took a long time to heal as the fractures were usually comminuted.

WAR ACCESSORIES

Forts and refuges (*'olo*). Many villages were protected by stone walls termed *'olo*. Some places of refuge also termed *'olo* were situated back in the hills but owed their protective qualities to natural inaccessibility to attack. No information was obtained concerning special defences erected by the refugees. In Olosenga, the whole raised plateau which could be reached only by two narrow zigzag tracks, was termed an *'olo*. The people took refuge there after defeat or to defend themselves against an overpowering force. Stones were piled up at the top of the paths and dislodged upon a pursuing enemy. In the back country of Upolu, caves have been seen with raised rock platforms within. The caves were probably used as refuges by fugitives and the raised platforms made as resting and sleeping places.

Pointed stakes (*su'i*). Some villages, such as Aunuu, were defended by setting pointed stakes in the ground with sharp points projecting upwards for a few inches. Canoe landings and the space before defensive walls were the usual sites for such defences. They corresponded to the spiked metal calthrops of Europe that were used to injure the hoofs of cavalry horses but the pointed wooden *su'i* pierced the bare feet of infantry warriors. They retarded the landing of hostile forces and impeded their mobilization for attack against defensive walls.

Armour. No field information was obtained concerning armour. If used at all, it must have been a foreign diffusion that did not become established in Samoan culture.

CARVING

Practically all clubs, except perhaps the bilateral-toothed clubs, the maces, and batons were carved in bands across the blade, shaft, and grip. Where more extensive, panels were formed on the blade and, as in the ear-shaped clubs, the head may be completely covered on either side. The area covered, however, is not so extensive as on Tongan clubs. Most of the authentic old Tongan clubs of the coconut stalk and narrow bladed paddle types were completely covered with carving from the distal to the proximal ends. The paddle club in Plate LII, *A, 2* is attributed to Samoa but the extensive nature of the carving which includes even the proximal round end of the handle, makes it more likely that the club is from Tonga and has been wrongly labelled. The lack of flaring, the absence of a lug, and the presence even of simple motifs

not characteristically Samoan (fig. 317, *e*, *f*, and *g*) leaves little doubt as to its foreign origin.

To carve by cutting away the surrounding surface to leave ribs or ridges in raised relief is termed *tongi* or *tongitongi* which corresponds to bas-relief or cameo carving. An experienced Samoan carpenter termed the method of carving clubs, *vane*, because the motifs were cut below the general surface. Thus *vane* is the opposite of *tongi* and corresponds to intaglio of which Samoan club carving consists. The chief carving motif is the small triangle termed *fa'amuli'ali'ao* (*fa'a*, like; *'ali'ao*, the *Trochus niloticus*; *muli*, the point formed by the apical whorls). The same term is applied to the triangle motif in tattooing which, however, is much larger than the triangle in carving. The chevron motif if deliberately cut out is termed *fa'avae'ali* (like the legs of a bamboo pillow) and a wavy line is *fa'anga'ai* (like the intestines). Small squares are termed *fa'amu* (like a draughts board) but as the game of draughts was introduced, the name and motif alike are modern. No other motifs could be given by my carpenter informant regarding the carving of clubs. The instrument used in carving was a shark's tooth. Short parallel lines arranged in panels to represent skeuomorphs of plaiting were not present in the Samoan material available but together with cross hatching were commonly used on both Tongan and Fijian clubs.

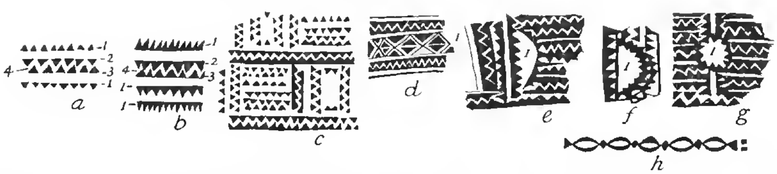


FIGURE 317.—Carving motifs on clubs: *a-d*, Samoan; *e-h*, probably Tongan: *a*, Small triangles cut in rows, with bases separate but on same line (1); two rows (2, 3) with apices facing and alternating to form zigzag line (4) between. *b*, Longer, narrower triangles (1) with bases coalescing; two rows (2, 3) with alternating apices facing and forming zigzag line (4). *c*, Combinations of triangle motif on head of ear-shaped club. *d*, More advanced use of triangle motif; two triangles (1) placed base to base to form a lozenge, with spaces between lozenges filled by triangles placed apex to apex. *e*, Curved motif (1) with serrated base: *f*, semicircular motif (1) with serrated circumference. *g*, Circle (1) with serrated circumference. *h*, Loop and tie motif, described as Samoan by Churchill. The carving, *e*, *f*, *g*, is from a probable Tongan club labelled "Samoa," but though the curved motifs are simple, they depart materially from the arrangement of triangles adopted by the Samoans.

The range of Samoan club carving is thus very restricted and is of diagnostic importance in recognizing clubs that have been wrongly labelled as Samoan. All weapons which depart from the use of the simple triangle motif have to be checked very carefully if attributed to Samoa. Such simple departures as the serrated crescent and circle (fig. 317, *e-g*) immediately cast doubt on the Samoan origin while the simple motive (fig. 317, *h*) which

Churchill (5, p. 150) terms the "loop and tie" occurs on a club that cannot be accepted unreservedly as Samoan in spite of its labelling. When such simple motifs are more than doubtful, the difficulty of accepting birds, fish and man as Samoan motifs becomes increasingly great. It is doubtful whether such zoomorphs and anthropomorphs, so common on Tongan clubs and to a smaller extent on Fijian, were ever used by the Samoans. Churchill (5, Plates XIV—XVII) figures 86 rubbings of birds, fish, and human beings and attributes 22 of them to Samoa. The 22 alleged Samoan figures were all derived from two clubs. The motifs which are reproduced in figure 318

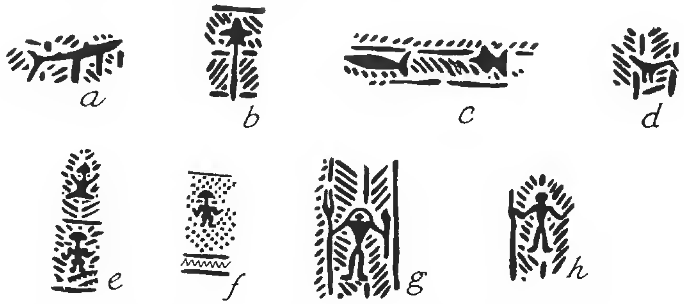


FIGURE 318.—Carving motives attributed by Churchill (5) to Samoa. The plate number and rubbing number given in brackets. *a*, (Plate XIV, 63) shark; *b*, (Plate XIV, 62), sting-ray; *c*, (Plate XIV, 71), fish and bird; *d*, (Plate XIV, 76), bird with long bill; *e*, (Plate XV, 104), man and bird; *f*, (Plate XV, 103), man; *g*, (Plate XVI, 111), man and arc, with weapons in either hand; *h*, (Plate XVI, 123), man.

The rubbings, *e*, *f*, are taken from one club numbered 3178 *a* and the others from another club, 2270, figured in (5, Plate III, *h*).

differ in no way from similar motifs on authenticated Tongan clubs. The lines surrounding the motifs are also typical of Tongan work. The club from which the majority of the rubbings were made was reproduced by Churchill (5, Plate III, *h*) and from the extensive carving combined with the "unusual diamond section of the stem and haft" (5, p. 58), little doubt exists that the club is Tongan. The other club from which the rubbings were made may also from the extent and type of the carving be more correctly attributed to Tonga than Samoa. The clubs in museums have caused much confusion to students from inaccurate localities given by those who donated or sold them. Thus the motifs regarded by Churchill as Samoan cannot be accepted as correct. Until further proof is adduced, the presence of extensive carving, which includes skeuomorphs, zoomorphs, or anthropomorphs, may be regarded as relegating the weapon to Tonga or Fiji.

SUMMARY

Foreign influence. Careful analysis of club forms would show that Fijian technique influenced Samoa very little. The Samoan club makers went

their own way and developed characteristic weapons with flared proximal ends and suspensory lugs as against the Fijian flange and close wrapping of the grip with sennit braid. The large number of bent forms such as the lipped, pandanus, and axe-bit types of Fijian clubs were not adopted in Samoa. The paddle-shaped club with the very wide crossbar seems to have diffused to Samoa in post-European times and not to have been adopted by the Samoan clubmakers. If further study proves that zoomorphs and anthropomorphs were really used in Samoan carving, the influence probably came from Tonga. The development of the paddle clubs needs further investigation. The narrow-bladed club with a curved distal end which is evidently a favorite in Tonga, was regarded by Churchill (5, Pl. III, *l*) as a paddle club without a crossbar but on examining a very old Tongan club of this type belonging to Professor Wood-Jones, the narrow width and thickness of the blade showed that its affinity was with the four-sided billet club with the curved blunt end. While the four-sided billet is present in Samoa, the characteristic Tongan development from the billet is absent.

Samoan characteristics. Samoan clubs are characterized by their short length. The two-handed clubs, except the shorter ear-shaped clubs, range between 3 and 4 feet in length and rarely exceed 53 inches. The majority of them are heavy and were used for crushing blows. The method of fighting from footholds used in club fighting with coconut leaf midribs, probably indicates a very early form of fighting in which heavy weapons were considered the most effective weapon. New Zealand tradition in the story of the avenging of the death of the son of Apakura, relates that the avenger Whakatau-potiki fought with his opponent from holes dug in the ground opposite each other. The Maori story belongs to the period before settlement in New Zealand. The Samoans have a similar tradition in which Apaula and Vaatausili play the same leading parts. The Maori story is important in showing that at one time they were acquainted with fighting from footholds as in Samoan club fighting.

The lighter paddle clubs in which a thrusting point is added to bilateral cutting edges marks a distinct advance in club technique. The lighter the weapon, the quicker the strokes and the more skill required in parrying and in footwork. The transference of the point to the lower end of the club was never adopted in Samoa. The flared proximal end with the suspensory lug distinguishes Samoan clubs from those of parts of Polynesia in which a stabbing point was formed below the hand grip at the proximal end. The double functioning ends form the highest development in wooden clubs. Such clubs increased the variety of strokes and guards and quick footwork was necessary to success. The light double-ended club reached its highest development in New Zealand and marks a great advance from the period of fighting from stationary footholds with which they were traditionally acquainted.

The definite use of the bow and arrow in fowling and fishing emphasizes its not being used as a projectile weapon in war. The sling was the definite projectile weapon in Samoa as in other parts of Polynesia. It evidently gave satisfaction as proved by its continued use and consequently there was no place for the bow in warfare.

RELIGIOUS OBJECTS

The acceptance of the teachings of Christianity has been so marked, and extended over such a long period, that information in the field regarding ancient religious regalia and sacred objects is difficult to obtain and lacking in detail. The Samoans have been influenced by teachers of their own race to become ashamed of ancient religious practices and to purposely deny even a theoretical knowledge.

Stone structures. Various natural stone formations that have religious or superstitious significance have been mentioned. Anything in the nature of the stone marae of Tahiti or the stone heiau of Hawaii was conspicuous by the absence of material and of information. It did not exist. The stone house of the Octopus has been discussed on page 324.

Wooden temples. The use of wooden houses with a thatched roof as a religious structure is discussed on page 70.

Sacred objects. Besides a material incarnation in some animal, bird, or fish, some of the Samoan gods seem to have had a material representative of some kind that was kept in the temple, treated with care, and consulted.

Turner (41, pp. 23-35) gives a number of these as follows:

God	Represented by
Aitu langi	Large shell
Faamalu	Trumpet shell
Le Fee	White shell (*Cypraea ovula*)
	Large wooden bowl (*lipi*)
	White bark cloth
Mao ma Uli	Two teeth of sperm whale
Moso	Large wooden bowl with white shells

A number of other gods had similar representations. The material objects were kept in the village temple.

A number of other stones representing gods were situated near particular villages and offerings placed on them at particular times, or when passing. Owing to some historical incident associated with ancestors who became gods, certain objects, such as plaited coconut leaves, coconut leaf baskets, and white bark cloth, were worn or treated with respect as being the symbol of the gods.

Idols. The objects representing the gods mentioned above were not carved in any way to represent a human figure or god. Any object considered the representation of the god obtained sanctity and power by association of ideas.

A carved wooden idol is figured by Kramer (18, vol. 2, p. 207) from the object presented to the British Museum in 1841. It is in human form with inset eyes, but in spite of its age and its source, it does not appear very convincing. Judd (17, p. 11) records a story of an idol of wood, about 1 foot long with large eyes and mouth, kept in a small box in the house of a Leone chief. It was exhibited on rare occasions and was seen by Judd's informant when a child. Idols may have been made but if so, few have escaped into the kindly refuge of museums.

PERSONAL ADORNMENT AND DECORATION

HEADDRESSES

Head coverings are not worn on ordinary occasions, but wreaths, banana leaves, bark cloth, and a special headdress of human hair, are worn as circumstances demand.

Wreaths (*pale*). These are made of flowers, leaves, and creepers on festive occasions. Even on ordinary days, anyone who has anything special to do such as making kava or poi for visitors, carrying stones for the church floor, or similar duties, often plucks the neighboring greenery to make a wreath for the head.

Banana leaf hat (*pulou lau fa'i*). Though going without protection so much, the Samoan does not care to have his head wet when working in the bush in the rain. A section of banana leaf with the stem behind is placed over the head and tied on with a strip of bark passing round the head circumference. The pointed tip end is then doubled back over the head and the tip tucked down into the bark tie behind. Plucking the banana leaf, or any leaf, for that matter, is *'oto*. Hence a saying applied to action which has become unnecessary: "A toe 'oto lava, 'ua la" (Why pluck again when the sun is shining?)

Turbans of bark cloth (*faufau tu*). A strip of bark cloth *siapo* was twisted round the head sometimes by fishermen but it could not be used in bonito fishing or mullet netting owing to special prohibitions. On occasions of war, the warriors often wore head coverings of cloth as a distinguishing mark against themselves.

Human hair headdress (*tuinga lauulu*). The *tuinga* headdress is a development associated with rank and status. Only certain families are allowed the privilege of wearing *tuinga,* and the honor became hereditary in the title with which it is associated. In important festivals, the *tuinga* is worn by the chief's official taupou and could also be worn by his son or manaia. The *tuinga* shown in Plate LIII, *B* was worn by Fa'apu'a, the taupou of Tufele at Tau, Manua. On occasions of war, it was worn by the chiefs or heads of families entitled to wear them.

The headdress consists of bleached human hair supported on a foundation of bark cloth and embellished with a *lave* upright framework decorated with feathers and a forehead band of shells. Sometimes an additional cover of feathers is used.

The type of hair preferred is frizzy (*mingimingi*) and thick (*pi'ipi'i*). In olden times, women cut their hair short and men wore it long. A girl with hair of the above type was allowed to let her hair grow long for making a *tuinga* for those who had the right to use them. A chief desiring hair (*lau ulu*) approached the parents of the girl and made arrangements for the supply.

The hair is tied together in tufts (Pl. LIII, *A*, 2). The process of tying is called *fa'atavaitui*, and the tufts so tied are *fua* or *fuatifuati lauulu*. The extra thick fibres called *tuatua* are selected from the hanks of dressed coconut fibre and used to bind one end of the tufts into a closed loop or eye. (See figure 319.) The tufts are strung on a cord passed through the eyes of the loop. The hair is bleached (*fa'aenaena*) by two methods: *a*, lime—the tufts are rubbed well with coral lime or soaked in a wooden bowl in a thick mixture of lime. They are then hung up on the cord exposed to the sun and rain in the open air. Some hair is sufficiently bleached in three months, but dark hair requires relimeing at the end of three months. *b*, Salt water—the long cord carrying the tufts is tied to a pole at both ends so as to stretch out the tufts. The pole is dipped in sea water and one end stuck in the ground to allow the tufts to bleach in the sun. The dipping in sea water and exposure in the sun is repeated daily until the hair is thoroughly bleached.

When sufficiently bleached, the hair is cleaned with *laumea* leaves (*u'u laumea*) and fresh water in which the leaves form a lather. This removes the lime or salt. The tufts are set up on a number of three-ply twisted cords of *fau songa*. The *tuinga* examined in Savaii had five cords on which were 32, 32, 31, 21, and 26 tufts, making 142 tufts in all.

The *lave* is an upright frame, now made of five slender wooden rods kept together with three crossbars. (See fig. 320.) The rods which originally consisted of coconut leaflet midrib wrapped round with *lauu'a* bark cloth, are now usually wrapped round with some gaudy red foreign textile.

Side cords are attached to the lower end of the frame to be used for tying the *lave* in position.

It seems likely that the wider framework diverging outwards and upwards is a modern development to provide a framework for the introduced glass mirror. The more elaborate form of midrib comb is known as *selu tuinga*, and was used with the *tuinga* headdress as its name indicates. Such combs or midrib framework decorated with feathers including the long feathers of the *tava'e'ula*, a species of tropic bird (*Phaeton rubricauda*), were the precursors of the more elaborate form of modern *lave*.

The forehead band (*pale fuiono*) was formed of a length of three-ply fibre braid to which was attached a width of bark cloth about an inch wide to form the foundation for the shell ornamentation of *fuiono* which Pratt

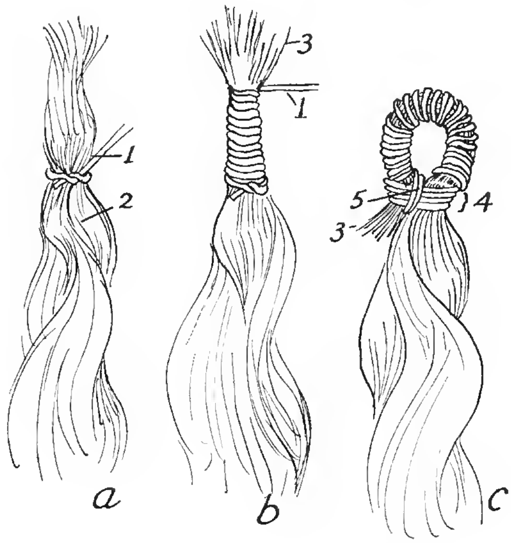


FIGURE 319.—Lashing of hair tufts (*fa'atavaitui*): *a*, the end of the *tuatua* fibre (1) is tied around the proximal end of the tuft (2) with a single overhand knot, sufficiently far from the end to form the eye by doubling over. The fixation of fibre forms the *fa'amau*. *b*, The fibre (1) is then wound around the hair towards the end (3) in a close continuous spiral (*saisai*) for about 1.75 inches. *c*, The end (3) is doubled back to form the eye and the fibre wound around both portions for several turns (4). This is usually enough as in the tufts shown in Plate LIII, *A*, 2, but some people run vertical turns (5) through the eye and between the end and the tuft, finishing with an overhand knot in the last turn.

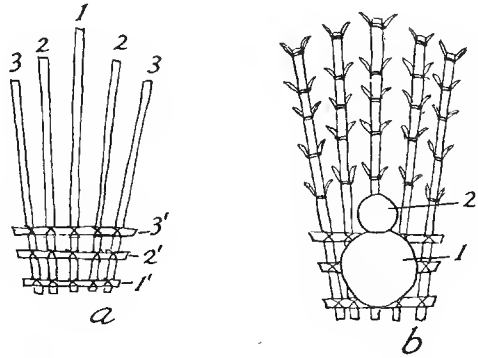


FIGURE 320.—*Lave* frame in *tuinga* headdress: *a*, five upright slender wooden rods; the middle rod (1), 22.5 inches long; the two intermediate (2, 2), 21.5 inches long; the two outer (3, 3) 20.5 inches long. The five uprights are lashed to three crossbars (1', 2', 3') in such a way that those on either side of the middle one diverge slightly outwards. *b*, Small white feathers are attached in pairs to the rods, at intervals so spaced as to form curved lines across the five upright rods. Mirrors are now set on the front of the frame, a large one (1) reaching from the lower to the highest crossbar and a smaller one (2) above it. The smaller mirrors may exceed one in number.

(23, p. 144) gives as *Nautilus pompilius.* The *pale fuiono* in Bishop Museum was described for me by Dr. C. M. Cooke, Jr. The shell elements are arranged on the band in two rows. The upper row is made up of the nuclear whorls of a nautilus which have been ground to an almost uniform size and polished. The lower row is made up of fairly uniform ground outer portions of one of the post nuclear whorls also polished. The upper and lower pieces form pairs probably taken from the same shell.

The outer end of the nuclear piece is cut off square and directed downwards on the band. The outer whorl piece is cut off square at the end, directed upwards and rounded off below. The nuclear piece is drilled through from the side at its upper part making two holes and drilled with one hole in the middle line near the lower squared edge. The pieces are sewn on to the band with one continuous thread through the upper pair of holes whilst separate knotted loops are passed through the single holes below. The lower pieces have a hole bored through close to the edge on either side at about the middle. They are attached by a continuous thread run along the back of the band with long stitches and with short stitches passing forward through the material and through the hole and back again before it makes another short stitch through the hole in the side of a neighboring shell. The lower pieces have the natural convexity facing outwards so that the concavity of the straight cut upper end fits over the lower part of the nuclear piece. The nuclear pieces thus have the appearance of large beads. (See Plate LIII, *A*, 1.) The Bishop Museum band had originally 17 pairs, but three pieces have been lost.

The cords carrying the hair tufts, the *lave,* and the forehead band are the essential decorative parts of the headdress, but each is independent of the other and are stored away as separate pieces. The headdress is only put together on the head of the wearer and taken to pieces again immediately after use. The assembling requires assistance.

The foundation (*pou*) is formed of a sheet of the thin *lau u'a* form of bark cloth. This is laid over the head and tied circumferentially round the head by a cord passing over it round the back of the head, across the temples and round the forehead. The cord comes low down above the outer end of the eyebrows in order to keep the sheet on firmly and prevent it being pulled upwards. When tied, the outer margins of the sheet are folded upwards and twisted to form an upward projecting knob on the top of the head. This knob is termed the *pou* (post) and gives support to the headdress. It must be large enough and high enough to allow the cords bearing the hair tufts to be tied to it.

The cords carrying the hair are wound round the knob and tied to it (*noanoa le lau ulu*) in such a way that the tufts are to the back and sides.

The *lave* is then placed in position in front in the middle line and the side cords passed round the knob below the hair and tied behind.

The forehead band now crosses over the lower end of the *lave* and the end cords are also taken round the knob beneath the hair and tied at the back. Two bands of *pale fuiono* may be used. They cover both the lower end of the *lave* and the edge of the bark cloth covering so that they conceal as well as embellish. The part of the band covered with shells is 10.5 inches long which is quite long enough as the ends are covered by the hair at the sides. All the ties of the cords of the various parts are completely concealed by the hair tufts which hang down at the back and sides over the cords. See Plate LIII, *B*.)

The above completes the true *tuinga* but a cover (*ufi*) may be used, consisting of the long feathers of the tropic bird or shorter feathers tied to coconut leaflet midribs (*tuaniu*). These may be stuck into the hair near the knob or tied to the *lave*. A smaller set of the red parrakeet feathers arranged in strings as in the *titi'ula* kilt may also be added over the top of the hair. Often the *titi'ula* is wound round the knob instead of hair.

The tufts of hair are lastly combed out with coconut leaflet midrib so as to fluff the hair out at the back and sides.

The drawback of the *tuinga* as a headdress is that it is not permanently put together. It is an addition of various elements that have not developed into one structural combination. The attachment of the bark cloth foundation by a circumferential cord leads to constriction of the blood supply causing headache, pain, and even fainting. Immediately the ceremonial is over, the wearers of *tuinga* disappear, glad to have them removed instead of flaunting them for as long as possible, which would occur if the headdress were a better organized structure.

HAIR ORNAMENTATION

The toilet of the body, and especially the hair, receives much attention. After the day's work in forest or sea, the fresh water pools or streams, where available, are in much demand. The Samoans say they cannot sleep at night if the sea salt is not removed by fresh water bathing, as it causes itching of their skin. In places like Tau where fresh water is obtained by seepage through the beach sand, holes are dug out with the hands to collect water. There the people wash and pour fresh water over the head and body with coconut shell cups.

Most people have a little toilet basket (*'ato ta'ele; ta'ele,* to bathe) in which is carried the soap or its Samoan equivalent and the husk of a particular kind of coconut with a soft fibre (17, p. 28). The soap material consists of the

leaves of the *toi* (*Alphitonia*) and the *fisoa* (*Columbrina asiatica*) which form a lather. The body and head are lathered and rubbed with the coconut fibre which is termed *pulu ta'ele*. The leaves are also rubbed against stones (*ma'a tamea*) to produce the lather. In addition to leaves, oranges and limes are now much in favor for washing the hair.

A clay (*u'u*), found in the beds of streams, is also used with fresh water as a soap and often left on the head for some time.

Chewed preparations (*tuitui*) of candlenut kernels, with orange leaves was rubbed into the hair to scent it. The term *tuitui* is now applied to any chewed preparation used for a similar purpose, such as *ifiifi* seeds (*Parinarium*) mixed with coconut oil and *langaali*. The bulbs of the *mumuta* are also chewed to form a *tuitui*.

Coconut oil (*lolo*), usually scented with sweet smelling leaves or flowers, was much used for rubbing into the hair and over the body after the bath, when the person had returned to the house to don a change of garment. In all dances of the *siva* posturing type, coconut oil was rubbed over the body so that the dancer entered the arena with the body gleaming with the wet oil.

The oil was prepared from the meat of the mature nut, grated and exposed to the sun. Leaves and flowers could be bruised and broken up with it. After sufficient exposure to make the oil run, the nut material was placed in a *to* wringer similar to that used in expressing the *'o'a* dye from the scraped bark of the *'o'a* tree. The wringer which, from its specific use in this instance, is termed *to tau lolo* was twisted with the usual pole and the oil ran down into a wooden bowl placed below. The oil, if already scented, was stored in coconut shells and corked. If not scented, the scenting material could be added to the prepared oil.

Lime (*namu*) from coral blocks burnt over a fire in a pit has been largely in use for mission houses and similar types of introduced buildings. The use of lime, however, as a mixture for plastering over the hair is ancient. It was the correct head covering in mullet netting and bonito fishing. On land, protection from the fierce sun in the hot season was obtained from the shelter of the houses and the shade of trees. The Samoan works usually in the early mornings and has a strong objection to exposing his body to the heat of the noonday sun. He is up and away attending to his duties while foreigners are still in bed. When the latter rouse to their activities, the Samoan returns from his plantation and sleeps during the period of heat. The higher culture is thus apt to wrongly accuse the Samoans of laziness as tourists and journalists see them during their resting period and not during the hours that centuries of tropical experience have laid down as the sensible period for physical

exertion. An appreciation of the amount of work done in the early morning in the plantations and the hours devoted to fishing in the evening and at night can only be formed by those who have lived in a Samoan village and shared its normal routine. In the forests, the belated worker obtains protection if needed by making wreaths of creepers and leaves. The Samoan, therefore, never invented an everyday form of head cover because probably his need was never acute enough. For the greater exposure in the waters of the lagoon and out at sea, when special fish seasons caused him to leave the houses during the warm part of the day, lime formed his only substitute for a hat. On land, shelter could be usually obtained for the work that had to be continued through the midday hours. Thus the guild of carpenters demanded a shelter shed in building either a canoe or a house. Those, however, working on the frame of the new house could not avail themselves of the shelter of the shed and they also had recourse to lime as a head covering. Lime was thus of practical use as well as ornamental. Some writers have stated that lime was used to bleach the hair and to kill parasites. Such uses are subsidiary to the main use of protection from heat when needed.

Dressing the hair. The women wore their hair short; the men kept their's long. After cutting, the women kept their hair short by singeing the ends with lighted bark. Besides using the pomades described and lime, women also stiffened their hair with breadfruit gum (*pulu*). After the use of pomades and lime, washing with limes helped to change the hair color to a brown which was greatly desired. Turner (41, p. 122) says the women wore a small twisted lock in a curl with the end lying on the left temple. Stair (33, p. 121), says there were seven different styles of dressing women's hair, denoted by the frontlets and the preparations used. These include the use of breadfruit gum and the clay pomade. The *tutangi ta* method, restricted to virgins, consisted of shaving the middle of the head from the front backwards and allowing the hair on the sides to grow long and hang loosely over the shoulders.

For men, the hair was cut or trimmed by regular attendants (*songa*) who acted as chiefs' valet and barber, besides cup bearer, trumpeter, and messenger. The *songa* used hinged cockle shells as forceps for pulling out the hairs of the beard. The thick fibres of coconut husk are also used by making an open overhand knot and closing it over a single hair by pulling the ends. The hair is then jerked out. Both processes were slow and painful. The beard was also shaved off with sharks' teeth. The hairs growing from the inside of the nostrils were also plucked. The long hair was tied in a knot called *fonga* and worn usually a little to the right side of the crown. It could, however, be worn to the front, back, or sides, as fashion directed. Stair (33, p. 120) states that there were 12 different combinations each distinguished by a name denoting the position of the *fonga*. Young men occasionally cut their hair

short with a small twisted lock hanging down onto the breast from either temple.

The body, besides being rubbed with coconut oil was, on occasions, rubbed with turmeric. In death ceremonials, when the turmeric kept for a father by his children (*lenga o le matua*) was handed out to the mourners, they proceeded to rub themselves with it.

Flowers worn through the hair or over the ear are termed *sei*.

Ribands. The white, silky looking material obtained from the outer surface of the young inner leaves of the coconut in long riband-like strips is tied in bunches to a piece of coconut leaflet midrib to form the ornament *sei milamila* which is stuck in the hair.

COMBS

Pieces of coconut leaflet midrib were used by the Samoans to comb out the hair in a similar manner to combing out the *lauulu* hair tufts of the *tuinga* headdress but they did not seem to have been combined into permanent articles for combing. Permanent articles termed *selu* were made for decoration. The teeth of the *selu* combs formed the lower ends of a decorative framework for sticking in the hair. Combs were made of both green and dry coconut leaflet midribs and of *pau* wood.

Green coconut leaflet combs (*selu tuaniu*) were temporary ornaments made from the green leaflet midrib (*tuaniu*) and were worn by the rank and file during any special activities, such as carrying stones for a house platform. Such combs were made in two forms; a horizontal row of triangles, or a long vertical form.

The triangular form (Plate LV, *A*, 7) consists of green midribs partly split to embrace a cross piece, with the split portions worked into triangles above the cross piece and the lower unsplit ends forming teeth for insertion into the hair. A number of triangles so formed were pushed together on the cross piece with their bases touching. (See figure 321.)

The long vertical form (Pl. LV, *A*, 1) consists of a number of long pieces of green midrib bound together with the long filamentous ends of other green midribs in three bands about 2 inches apart. The lashing of the bands consists of wrapped work technique in the upper band and half of the middle one while the rest is finished off with a wrapped twine. The technique is described in the next type of comb.

Dry coconut leaflet combs (*selu tuinga*) were made of dry midribs which were scraped and rounded and fastened together with strong single coconut husk fibers in wrapped twines which form good examples of Samoan fine work. Decorative variety was obtained by using hair in the bindings and in post-European times by the addition of glass beads.

The type comb (Pl. LV, *A*, 5) was commenced at the narrow top end with 9 pieces of midrib each 7 inches long. The first lashing row was a fixation lashing formed of a combination of wrapped work and a wrapped twine. (See figure 322.)

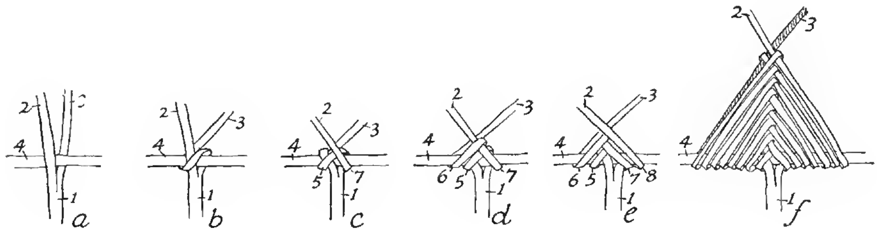


FIGURE 321.—Coconut leaflet comb (*selu tuaniu*): *a*, a long piece of green midrib (1) is split evenly into two (2 and 3), commencing at about 3 inches from the butt end and continuing right through to the tip end. An unsplit midrib strip (4) is used as a crossbar and passes between the split portions of (1) of which the left piece (2) is in front. *b*, The rear strip (3) is brought forward over the cross piece (4), diagonally down to the left over the front piece (2) and back under the cross piece to its original side. *c*, The front strip (2) is wound diagonally over the back to pass to the right of the stem (1) and cross diagonally upwards (7) and to the left over the front of the cross piece. *d*, The rear strip (3) repeats its forward diagonal turn to make a second turn (6) parallel to its first turn (5) and return to its position at the back. *e*, The front strip (2) repeats the diagonal turn (8) parallel with its first turn (7). *f*, Alternate turns are made by the two strips, each turn to the outer side of the previous one until the triangle of six or more turns of each is formed. The ends are simply passed through under the last crossing strip.

About 1 inch from the first lashing, the primary set of nine midribs was reinforced by another nine midribs placed individually on the right sides of the previous elements. The 18 midribs were lashed together in exactly the same method employed in the first lashing except that the passive element of the weft was in front. The wrapped work is made with the long ends of the midribs towards the worker. (See figure 323.)

Owing to reversing the sides on the completion of each course, the binding turns which are always made towards the right, show in opposite directions on each course and thus give a chevron effect. The hair strands are crossed on each other at the end of each course. When sufficient depth has been obtained, the horizontal hair strands are fixed by tying them together with a reef knot, generally in the space between the marginal and the premarginal midribs to hide the knot. Variety for decorative effect is obtained by change of material. In the comb described, 14 courses were made with hair, then 6 courses with thick coconut fiber, followed in turn by 4 courses of thicker strands of hair (with hair also as the binding material), by 8 courses of hair with coconut fiber binding and ending up with 4 courses of coconut fiber. The two horizontal elements, in this instance, were finished off with a reef

knot on the outer side of the marginal midrib while the end of the binding element was knotted around a midrib. In some combs the end of the binding element is simply pushed back between the layers formed by the transverse courses. The depth of the comb covered by the transverse courses was 1.8 inches and the lower ends of the midribs project below as free teeth for 4 inches.

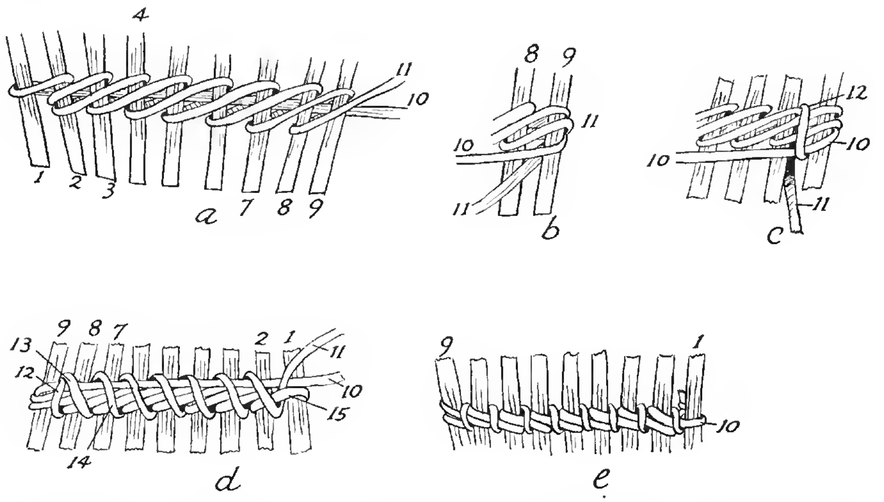


FIGURE 322.—Wrapped work and wrapped twine (comb): *a,* with the short ends of the midribs towards the worker, the wrapped work commences on the left side on the first midrib (1). A long piece of thick coconut fibre (*tuatua*) is doubled round the left side of the midrib (1). One end (10) remains passive and is passed horizontally along the back of the midribs. In length it is a little more than twice the width of the comb at this part. The active part (11) makes the first series of wrappings. From the first midrib (1), it passes to right over (1 and 2), turns around the back of (2) downwards and to the left to reappear in front in the space between (1 and 2) and below the previous turn. In passing around the back, it crosses over the horizontal passive element (10). From the first interspace, the active element makes an anterior turn upwards and towards the right over two midribs (2 and 3), passes back and down towards the left around the same two midribs to reappear again in the first interspace below the second anterior turn. In passing around the back, it again crossed over the passive element (10). All turns at the back pass over the passive element which is thus completely hidden. From the first interspace, the active element passes upwards and to the right over three midribs (2, 3, and 4). It turns around 4, downwards and to the left over two midribs (4 and 3) and emerges in front in the second interspace between (2 and 3).

The wrapped work technique is now established. In front, towards the worker, the active element passes upwards and to the right over *three* midribs and at the back, it comes back over *two.* Each turn thus advances by the space of one midrib. The last three midribs (7, 8, and 9) are crossed anteriorly and after the fibre returns back over two at the back (8 and 9), it passes over the same two anteriorly. This ends the wrapped work stage of the lashing and was used in the upper and part of the middle lashing in the preceding comb. *b,* The passive element (10) which projects out beyond the right is doubled around the end midrib (9) and brought horizontally along the lower side of the wrapped lashing in front, where it again remains passive. The active element (11)

passes around the end midrib (9), passes over the passive element (10) and reappears below in the end space between the midribs (8 and 9). *c,* The active element (11) takes a vertical turn upwards (12), passes back and down around the wrapped turns and reappears in the same interspace. *d,* The wrapped twine technique now commences. The craftswoman turns the work so that she may work from left to right and thus use the left hand and thumb for holding the turns made and the right hand for threading the end of the active element through the interspaces. The last midrib (9) is thus on the left, the passive element (10) above the wrapped turns and the active element (11) above the wrapped turns in the space between the midribs (9 and 8). The active element (11) passes obliquely downwards towards the right over the midrib (8) and goes back in the interspace on its right making the turn (13). It turns vertically upwards around the wrapped turns at the back and comes forwards through the same interspace. It then descends obliquely to the right over the next midrib (7) making the turn 14, passes back in the interspace on the right of the midrib (7), passes vertically upwards at the back around the wrapped turns and comes forward in the same interspace. This wrapped twine is continued, downwards and to the right over each midrib and vertically upwards at the back to reappear above in the same interspace. The passive element (10) is crossed by each turn in front. On arriving at the last interspace on the right between the midribs (2 and 1), the active element (11) passes up at the back around the only complete wrapped turn (15) in this space and coming forward is tied with a reef knot to the end of the passive element (10). *e,* Viewed from the back, the reverse wrapping turns passing over two midribs with the vertical turns of the wrapped twine are shown.

The other varieties of *tuinga* comb shown in Plate LV are based on the same principles of construction as the one described but are rendered more ornate by the addition of beads. In some of them, not all the upper midrib ends reach the apex.

In the comb (Pl. LV, *A,* 6) the two middle midribs and each marginal one reach the top but a short midrib extending from the lower end of the decorative lashings is added to the outer side of the marginal midribs. The other midribs forming the comb are cut off obliquely a little above the main cross lashing. The main cross lashing before the commencement of the decorative courses consists of wrapped work over threes for one course which is followed by a wrapped twine. The decorative part is embellished with rows of white and blue beads added to the binding element on every third course after it makes the crossings to either side. The midrib pairs that project upwards to the apex are wrapped with a spiral of coconut fiber on which beads are strung at intervals. After stringing a bead, the fiber passes between the 2 midribs and thus fixes the bead in position.

In the comb (Pl. LV, *A,* 2) the two middle and two marginal midribs from either side are carried up to the apex. The other midribs are cut off straight just above the main cross lashing. The lashings consist of wrapped work without the wrapped twine. (See figure 324.)

The comb (Pl. LV, *A,* 8) is taller and more elaborate in the arrangement of beads.

The *tuinga* combs are interesting from the use of simple wrapped work and wrapped work combined with a wrapped twine which establishes this form

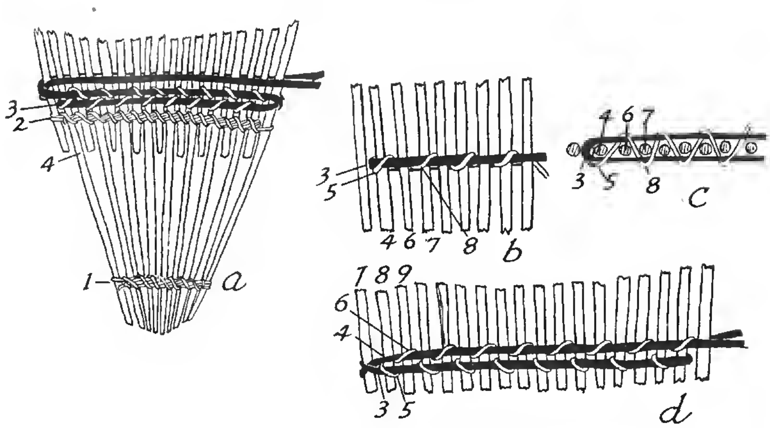


FIGURE 323.—Comb binding: *a*, an inch from the first binding (1), the 18 pieces of midrib are lashed together with a similar binding (2) as stated. Immediately beyond the second lashing (2), a long strand of horse hair (3), containing about 6 or more hairs, is doubled around the second midrib (4) from the left and runs parallel towards the right with the second lashing. A portion of the hair strand is on either side of the row of midribs at the same level. *b*, The hair strand (3) is lashed to the midribs by a single thick coconut fibre (5), which is tied to the midrib (4) between the hair strand and the second lashing so that the knot is concealed. The fibre (5) is then brought up diagonally across the crossing of the hair strand (3) and the midrib (4) in a direction upwards and to the right. It then crosses to the other side in the interval between two midribs, passes under the hair strand at the back, crosses upwards diagonally to the outside of the crossing of the hair strand with the next midrib (6), passes over the strand and returns to the near side in the next interval between the midribs (6 and 7). On the near side, it passes under the hair strand and then up over it on the outside of the crossing with the midrib (7) thus making the loop (8). In this way the fibre zigzags from side to side in each inter-midrib space. The alternate midribs are crossed by the fibre from below upwards and to the right on one side and the other alternates are crossed in a similar manner on the other side. *c*, The method in which the fibre crosses is shown in cross section, where (3) is the horse hair strand doubled around the midrib (4). The coconut fibre (5) is shown coming up from below the midrib (4) and crossing in the space between the midribs (4 and 6) by passing *over* the hair strand on the far side and then *under* the hair strand on the near side. It makes the crossing (8) and continues as shown.

When the cross binding with the fibre reaches the right margin, the comb is turned in order that the right margin where the binding finished may be on the left and the work proceeds again from left to right on the next course formed with the braid strands. *d*, The numbering in the figure does not follow that in the previous figures. The first course of the hair strands (3) after being bound on the second last midrib (8) by the turn (5), is terminated on the marginal midrib (7) by crossing the two hair strands so that the near strand goes to the back and the far strand appears on the near side of the midribs. The two strands are then doubled around to the right to form the next course (4) parallel with the previous one.

The coconut fibre (5) passes to the back in the space between the midribs (7 and 8) and takes a turn around the hair strand of course (4) on the far side of the midrib (8). It then crosses in the next space between (8 and 9) and reappears on the near side under the hair strand to make the turn (6). From here the technique is exactly as before.

of lashing technique in the Samoan area. The modern addition of beads does not detract from the fact that the lashings binding the midribs together are true Samoan work. The wrapped work technique has already been encountered in the lashing of the bamboo walls of the house on the double canoe. The affinity between the two forms is marked for in the house wall the wrapped turns pass around a horizontal wooden rod while in the comb lashing, the wrapping turns pass around the passive element of the weft which lies horizontally against the midribs. The horizontal element in the comb weft stiffens the lashing and makes it more efficient.

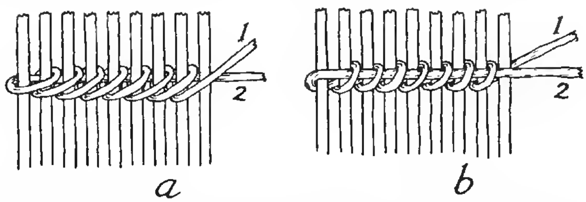


FIGURE 324.—Wrapped work: *a*, front view—the active element (1) of the weft crosses two midribs in front; *b*, back view—the active element (1) crosses one midrib at the back and also passes around the passive element (2) of the weft. Beads may be threaded on the active fibre (1) after it appears on either side of the midribs and on whatever rows are desired.

The *selu tuinga* as the name implies was associated with the *tuinga* headdress of human hair and was probably used more before the elaborate *lave* frame with mirrors was introduced into the decorative scheme. The term *selu tuinga* is sometimes applied to the long vertical comb made of green midribs (Pl. LV, *A*, 1) which on account of its length was sometimes used as a framework for feathers with the *tuinga* headdress. The association of the comb with the headdress has probably led to the wrapped work technique being used with the rather inferior material of green midribs.

Wooden combs (*selu pau*). Wooden combs cut out of *pau* wood conform somewhat in shape to that of the dry leaflet combs. Of two combs figured, one (Pl. LV, *A*, 3) is cut short at the upper end but a middle vertical projection carries out the idea of the triangle. A longer form (Pl. LV, *A*, 4) projects well upwards and maintains the triangular shape more clearly. Holes, circles, and semicircles, with radiating spaces, have been cut through the wood and the triangle motif is carved in intaglio. The general shape of the comb and the use of intaglio carving come within the sphere of Samoan craftsmanship but the perforated work creates the suspicion that the carved wooden comb is a modern development rendered possible by the acquisition of steel tools.

EAR ORNAMENTS

The ears according to my informants were never pierced and consequently special ear ornaments were unknown. Turner (41, p. 122) states that the

ears were sometimes pierced with a thorn to carry a flower but it was uncommon. The two statements coincide regarding the lack of special ear ornaments, and hence offer a marked distinction to the personal decoration of the neighboring Melanesian area as well as the somewhat barbaric display of the higher cultures.

NECKLACES

Necklaces of various kinds come under the general term of *'ula*. They were made of flowers, leaves, fruit, seeds, shells, and whale ivory.

Flowers. The flowers generally used were those of the *mosooi* (*Canangium odoratum*), *pua* (*Plumiera*), *langa'ali* (*Aglaia*), *singano* (male *Pandanus* flower), *suni* (*Phaloria burnettianes*), *pipi, moa fa'i* (petals of banana flower), *pualulu, teuila* (ginger), *nu'anu'a* (*Nelitris vitiensis*), and *'alo'alo* (flower of *ngatae, Erythrina indica*).

The flowers or the petals are threaded on to a strip of *fau* bast to the end of which a piece of coconut leaflet midrib is attached as a needle. It is usual to space the flowers with scented leaves and much time is spent in blending various flowers and leaves. The girls of the family and the village taupou not only make the *'ula* for themselves but also for the guests who happen to be staying with them. Any festivity or ceremonial occasion is marked by the wearing of flower necklaces.

Leaves. The *lau maile* (*Alyxia*) is a favorite material. The *maile* vine is picked and the bark together with the leaves removed from the wood. A fern (*langasese*) and a strong-smelling shrub (*usi, Evodia hortensis*) are among those used.

Fruit. Of fruits, *fala* (pandanus fruit keys) is the most popular. In Tutuila, the *'ula fala* seemed the favorite decoration of talking chiefs and I was frequently decorated with them after the speeches were concluded as a mark of attention from one talking chief to another. The *polo* and *poloite* which includes both *Solanum* and *Capsicum* and *matalafi,* a smaller *Capsicum* were much used. The *seasea* (*Eugenia* sp.), *sea* (*Parinarium insularum*) and one or two of the fairly large fruit of the *oli* (*Eugenia neurocalyx*) were also used interspaced with flowers and leaves. Flowers, leaves, and fruit, formed perishable necklaces used for the one occasion and hence selected from the material available on that occasion.

Seeds. Red seeds (*lopa*) were much in use so that *lopa* is also used as a name for necklaces made of seeds. Another red seed used is the *matamosimosi*. The dark seed in the fruit of the *pu'a* (*Hernandia peltata*), the dark seeds of the *Tantania,* and the river reed (*sangasanga*) are also used.

Shells. Land shells (*sisi vao*), sea shells (*sisi tai*), and fresh-water shells (*sisi vai*) of various kinds are used. Of the sea shells, the small cowries (*pule*) and a spiral shell (*pangea*) are among those used.

Holes were formerly bored through seeds with a sharp thorn and through shells with the drill. These necklaces are more permanent and are often taken from island to island. Both seeds and shells if obtained from necklaces do not necessarily belong to the island where the necklace was procured. Natives themselves may perpetuate an error by saying the shells are obtainable on their island from a resemblance to a local species.

Whale ivory necklaces. The most valuable of all necklaces (*'ula*) were those made of whale ivory (*lei*) and hence called *'ula lei*. (See Plate LIV, *D*, 2.) The material was obtained from whales teeth which were ground down into long curved, pointed pendants. Those in the necklace figured range in length from 3.3 inches at the sides to 5.6 inches in the middle, without allowing for the curve. The greatest width is from 0.4 to 0.5 inches. The thick end is cut off at a slant towards the concave side. All are curved and brought to a long slender point. In section they are fairly round. They are bored through transversely about 0.3 inches from the thick end and in such a way that when strung on a cord, the concave sides are all on the same surface. The method of attaching to the cord is shown in figure 325.

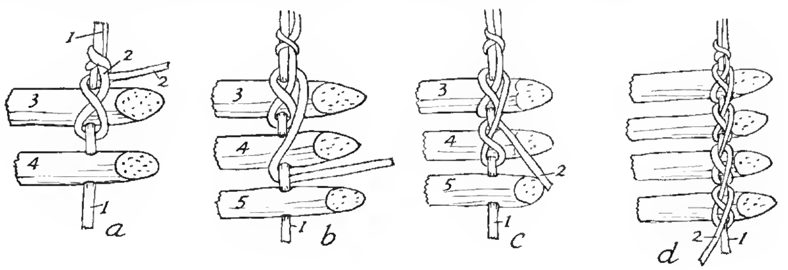


FIGURE 325.—Whale tooth necklace lashing: *a*, the cord (1) is composed of four smaller cords which are passed through the holes in the pendants. The cord (2) is a single cord the same size as the other four. It is knotted to the passive cord (1) near the first pendant (3). The active cord (2) makes a figure-of-eight turn around the ends of the passive cord (1) and over the back or convex side of the pendants. Hence in the figure it crosses the back of the pendant (3) to the left of the passive cord on the near side, passes under it to the right, crosses obliquely back to the left of the passive cord on the far side, and then passes under it. *b*, After the first figure-of-eight fixing the first pendant (3), the active cord passes over *two* pendants (3 and 4) to the left of the passive cord on the near side of (4) and passes under it to the right. *c*, From the right, the active cord completes the figure of eight by crossing diagonally over the new pendant (4) to the left of the passive cord on the far side and passes under it to the right. *d*, The technique is established. After completing the figure-of-eight turn on one pendant, the active cord crosses two pendants and completes the figure of eight on the newly added pendant of the pair.

After the last pendant is fixed, the cords are knotted. The necklace is hung round the neck by the cord. The convex surfaces of the pendants rest against the breast and the points project outwards from the body.

By making the figure-of-eight turns over the back of the pendants, the lashing is not noticeable when the necklace is worn. The necklace is worn by high chiefs and the village maid when in full dress regalia. An *'ula lei* necklace is really essential to complete the costume on dress occasions.

BREAST ORNAMENTS

The boar's tusk was worn as a breast ornament. Edge-Partington (10, vol. 2, p. 43, No. 4) figures one suspended to three braided cords by a loop passed through a hole bored through the thick end.

Edge-Partington (10, vol. 1, p. 77, No. 4) also figures a breast ornament from Upolu that is in the British Museum and states that it was worn by men in night dances. The material used is not described.

ARMLETS AND ANKLETS

Leaf armlets and anklets (*taulima* and *tauvae*) are made of banana leaf or ti leaf when festivities are on. In serving any special foods such as *poi* and *taufolo,* the server usually marks the occasion by wearing a wreath necklace, or a piece of the above leaves tied round the arms or ankles. In the *siva* and *poula* dances it was usual to wear armlets and anklets of ti leaf or *lau maile.*

Seed anklets are made of the large seeds of the *ifi lele* (*Afzelia bijuga*). The large, flat, elliptical seeds are cut in half and holes drilled through the ends. Pieces of the thin *lau u'a* cloth are threaded through and knotted at the end which is left in the hollow interior of the seed. The strips are then plaited together in a three-ply braid, the ends of which are tied round the ankle. The seeds rattle against each other as the wearer dances. Single seeds to each cloth strip is a style said to be for males; two seeds to each strip, for girls. Though said to have been in vogue for some time, many maintain that they were introduced from Uvea Island.

Boar's tusk armlet. A boar's tusk drilled to carry a cord was worn round the upper arm. (See Plate LIV, *D,* 1.) White cowrie-shells were also worn on the upper arm in the same position as the boar's tusk.

BODY DECORATION

Garments, such as the fine mat, the various forms of kilts and bark cloth material worn as a skirt and a belt, have all been described. It is again stressed that these articles were not used as ordinary clothing, of which there was little need, but chiefly as personal adornment to distinguish rank during festive and ceremonial occasions.

Human hair belt. The belt of human hair figured in Plate LIV, *D,* 3 in Bishop Museum is attributed to Samoa. It consists of 110 strands of three-

ply-braided hair doubled at each end and seized to make eye holes. The length is 39 inches.

Such belts were made in Niue and other parts, but were not mentioned to me by Samoans when discussing clothing and ornamental accessories. The locality of the belt may quite possibly be an error.

STAFFS

Both high chiefs and talking chiefs used wooden staffs (*to'oto'o*) as walking sticks on ordinary occasions, and as a symbol of rank during ceremonial conducted in the open air. The staffs are long rounded sticks, smoothed and polished. One presented to the Bishop Museum expedition by the chief of Malaeloa, Tutuila, is in the form of a short spear with barbs cut at the pointed end out of the solid. (See Plate LII, *B*, 3.) In Tutuila, it was held that a talking chief's staff should not be higher than his own height, but there was no such limitation to a high chief's staff. When making a speech standing in the open air, a talking chief placed the lower end of his staff between the big toe and second toe of the right foot and kept both hands on the staff. The high chief on the few occasions that he did speak, placed the lower end where he wished. The staff was held erect with both hands and the speaker did not shift his staff or his ground. On occasions, however, when trouble was imminent, the talking chief swayed his staff and informed his own party by prearranged signals to mobilize and be prepared for a surprise attack. The talking chief's staff is termed *to'oto'o fai launga* (staff with which a speech is made).

FLY WHISKS

Fly whisks (*fue*) were made of a number of short lengths of sennit braid attached to a wooden handle. The technique was demonstrated by Mikaio of Tau. The fibres were taken direct from the *matofi* hank and twisted as the braiding proceeded without making the usual *fa'ata'a* rolls. In this way, thinner braids were formed than the usual sennit braid for lashing purposes. (See figure 326.)

Fly whisks are of two forms; those used by high chiefs, and those by talking chiefs. Formerly the high chief's whisk consisted of a few short lengths of sennit braid lashed to a long handle but it has lately become the custom to use the hair from a white horse's tail and to regard that as the exclusive type for a high chief. The horsehair is braided in three-ply and attached to the handle in the same way as the coconut fiber. The talking chief's whisk is the symbol of his office. In the story of the ancestor Pili, he gave the middle district of Upolu and the fly whisk which symbolized oratory, to his son Sanga after whom the district was named Tuamasanga. The handle of the orator's whisk is shorter and thicker than those used for

high chiefs' whisks and has more and longer braid ends. (See Plate LIV, *B*.) On official occasions, a talking chief dresses in bark cloth with a fine mat skirt on the outer side and an appropriate wreath round the neck. He carries his orator's staff in his right hand and his heavy fly whisk in his left.

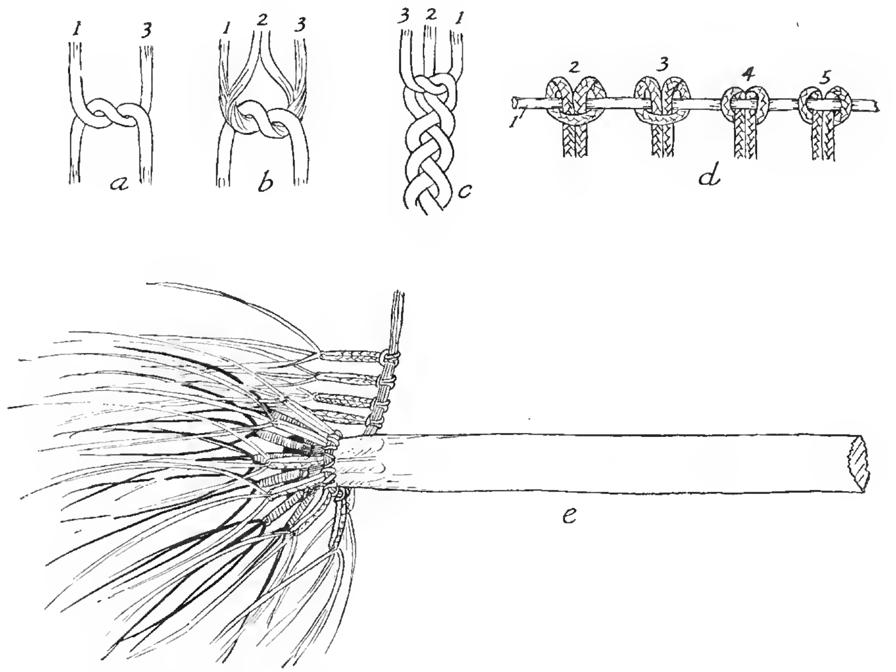


FIGURE 326.—Fly whisk technique: *a*, two sets (1, 3) of fibre are crossed as in the first part of a reef knot. *b*, The two ends directed away from the body (1 and 3) are divided so as to form a third ply (2). *c*, With the three plies formed, the ordinary three-ply braid is plaited, other strands of fibre being added as the plies shorten and the ends turned down in the usual braid join. The braiding is continued for about 21 inches and the end stopped by tying the two outer plies (1 and 3) in the first part of a reef knot over the middle ply (2). The two free ends at the commencement and the three plies at the end are all purposely left long to form free tufts at either end of the braid length. A number of similar braid lengths are made according to the size of the whisk desired. *d*, A two-ply twisted cord of sennit is made. To the cord (1) the braid lengths are attached (2 and 3) by doubling the braid, passing the loop under the cord from the far side and passing the ends through the loop after bringing them over the cord. Two were attached in this way and the next pair (4 and 5) reversed by passing the loop forward under the cord from the near side, bringing it back over the cord and then passing the ends through it. All the braid lengths are thus attached to the cord in alternating pairs. *e*, A suitable wooden handle with a groove cut around the thinner end has one end of the cord tied around the groove, with the braid lengths projecting away from the handle. The cord is wound around the handle in close turns and the braid lengths thus bound down to it. The cord after the last braid length is bound down is continued along the handle for a few turns and the end fixed by turning it back under three or four loose turns which are afterwards drawn taut and the slack pulled up.

When speaking, he balances the fly whisk over his shoulder with the handle in front and part of the braid tails hanging over his back to keep the whisk in position. Timu, the talking chief of Safotu, Savaii, is shown in Plate LIV, *C* in full dress with the orator's fly whisk in position.

FANS

Fans (*ili*) are made of coconut leaf, pandanus, and wood. Coconut leaf fans are divided into two kinds according to the treatment of the leaf which results in different shades of color.

The brown coconut leaf fan (*ili aulamalama*) is made of ordinary dried coconut leaf (*aulama*). The tip end of the leaf is used and the leaf midrib forms the handle. The leaflets are first plaited in check over the midrib to cover it and then continue on the opposite side from which they originated, in the check technique. From the midrib the plaiting spreads out to form a widely curved edge. The example shown in Plate LV, *B*, 1 is narrower than the average. From the side edges and the far end, the leaflets are doubled back into the body of the fan.

The white coconut leaf fan (*ili tea*) is made from the young unfolded leaf (*moemoe*) which on bleaching in the sun assumes a whiter color. The whiter color (*tea*) gives the fan its name. The leaf midrib is also utilized and the leaflets plaited over it to diverge to the opposite sides. The plaiting is so arranged that the near part of the fan is carried out at right angles to the handle to attain the widest diameter and then curved forward to a mesial point (Pl. LV, *B*, 3) or to a bifurcated end (Pl. LV, *B*, 2). In the *ilitea*, the wefts are much narrower than in the previous type and additional separate wefts have to be added.

In the bifurcated fan (Pl. LV, *B*, 2), the additional wefts are added in a bundle on either side of the midrib and covered by the wefts springing from the midrib stem. The wefts belonging to the midrib form the lower part of the fan with a check plait. The added wefts then diverge out above them and continue the far end of the fan in a twilled-two plait. Colored material has also been added. The rim is formed by a particular check technique, but no opportunity occurred of seeing the details of plaiting fans. In the pointed fan (Pl. LV, *B*, 3), the check plait is pursued throughout and the crossing elements are added as individual wefts at the proximal base. Openings are also made as a decorative element. Both fans have wooden handles lashed to the butt of the coconut midrib stalk.

Pandanus leaf fans (*ili fala*) are made of pandanus wefts with a check plait and of the shape of the example in Plate LV, *B*, 4. A wide strip of bamboo is used as a handle which is placed in position and covered with the plaiting.

Wooden fans (*ili pau*) are made of *pau* wood with a saw after the manner of the wooden combs (Pl. LV, *B*, 5). They are highly thought of by the Samoans but like the combs, they must also be regarded as a modern development rendered possible by the acquisition of steel tools.

Use. Fans are used not only to cool the user but to keep away flies during meals. Female attendants fan the guest during meals as part of the courtesy devolving upon hospitality and at the same time they keep a wary eye on flies attempting to share in the food. The fanning motions are thus divided between the guest and the food.

SUMMARY

The material for decorative adornment was obtained mostly from the native flora of the islands. The Samoans have a deep-rooted love for flowers and leaves not only for their beauty and shape but even more so for their sweet scented odor. Wreaths and necklaces were further supplemented by fruit of appropriate size and color and by seeds. The leaves and bast of plants supplied the kilts and garments which cannot be dissociated from decoration. Coconut leaves supplied the material of most of the combs and fans. Sennit fiber entered into the fly whisk and furnished material for binding. Wood entered into the *lave* frame, handles, and the combs and fans of doubtful antiquity. Beyond vegetable matter there was little scope in material. Small shells from land, sea, and fresh water furnished necklaces while the lack of pearl shell prevented its use as a material for breast ornaments. Red feathers that were universally prized by all branches of the Polynesians were scarce and practically monopolized for fine mats. Other feathers were utilized for the few kilts made and in association with the headdress but featherwork as a whole was very restricted in both scope and technique. Human hair figured in the important headdress, in *tuinga* combs, and the doubtful belt. The pig's tusk furnished armlets and breast ornaments while the teeth of whales supplied material for the valued necklace.

The technique in ornamentation did not progress very far. Wrapped work combined with a wrapped twine and figure of eight turns were utilized as lashing techniques. The poor progress in decorative technique is exemplified by the separate elements of the *tuinga* headdress. The seizing of the hair tufts is a wide-spread technique used by the Marquesans with tufts from old men's beards and by the Maori with hair from the tail of the native dog. The Samoans went a stage further in binding the seized ends into eye holes for stringing on a cord but they lacked the finish to combine the bark cloth, hair tufts, *lave* frame, and forehead band into a permanent structure. The high status of the headdress and the physical inconvenience suffered by the wearers should have supplied sufficient incentive, yet Samoan craftsmanship stopped short with the individual elements. It may be that the *tuinga*

headdress had not been incorporated in Samoan culture long enough to allow a special technique to develop; otherwise the lack of a better method of combining the elements of the headdress indicates a lack of initiative in Samoan technique.

The social value of decoration and its accessories is evident. While flowers and leaves were worn by individuals on any occasion through love of them, the more lavish use by the community marked events of social importance. Even for a solitary guest, the person preparing a bowl of kava will often tie a leaf of ti or even a strip of banana leaf around the head or neck to add importance to the occasion. Flowers, leaves, fruit, seeds, and shells were readily available to all classes of society but the pig's tusk and whale's teeth owing to their scarcity and the necessity for more technique in converting them into ornaments, became associated with those of superior rank. The rarer ornaments were the ornamental adjuncts of the superior types of garments, and became a form of wealth, in themselves indicating higher social position.

The staff and the fly whisk also distinguished social position. Thus, the staff distinguished the head builder among the members of a guild who were erecting a new house. The diplomatic talking chiefs restricted the length of their staffs to the height of their own bodies and the superior status of the high chiefs was distinguished by a longer staff. The talking chiefs soothed their own vanity, however, by creating a more ornate fly whisk which not only distinguished them from the high chiefs as a special class but drew particular attention to their high office as public orators. In making such a departure, they were supported by the traditional dictum of the ancestor Pili that the fly whisk symbolized oratory. The *tuinga* headdress through being restricted to the holders of certain titles was a further distinction of class within class.

TATTOOING

The Samoans are the one branch of the Polynesians who have retained the full tattoo designs of the past as a necessary form of decoration in the present. Tattooing is actively carried on throughout the group with the exception of Manua. As an expression of religious zeal, the chiefs prohibited the operation from being performed in that group. Though literally obeyed, a fair percentage of the youth of Manua go to Tutuila to be adorned there with the decoration which symbolizes the approach of manhood. The males are tattooed from waist to knee, sometimes on the hands and wrists, but never on the face. The demand for tattooing created a body of skilled craftsmen who followed or developed a form of masculine design, common in the arrangement of its main units but differing in the enhancement and detailed treatment of those units. The actual tattooed lines are termed *tatau,* the operation

ta tatau, and the expert craftsman *tufunga ta tatau.* Females are tattooed on the legs with sparser lines and on the wrists and hands. Female decoration is not called *tatau,* but is termed *malu.*

IMPLEMENTS

The implements and material required by the expert are a set of tattooing combs kept in a special receptacle, a tapping mallet, mortar, pestle, candlenut soot, and a palette for the pigment when operating. A small wooden bowl of water in which to rest the combs and an assistant with a supply of damped bark cloth to use for sponging complete the preparations for the operation. (See Plate LVI, *B.*)

Tattooing combs. The *au* tattooing comb consists of a serrated bone attached transversely like an adz to a handle. In olden times, Turner (41, p. 89) says a piece of human bone from the pelvis (*os ilium*) was used to form the comb. They are now made of boar's tusk ground down into plates not exceeding 1 mm. in thickness, ranging from 5.5 mm. upwards in width, and from 17 to 31 mm. in depth. The width of the plates varies with the width of the curved sections of the tusk. The vertical axis of the plate corresponds with the long axis of the tusk. The upper edge is bevelled on the anterior surface.

The bone plate is lashed to a plate of turtle shell which makes the connection with the handle. The turtle shell is ground down to an average thickness of 2 mm., though in a few instances it may be as little as 1.5 mm. or as much as 2.5 mm. The width and depth varies with the variety of comb. (See figure 327.)

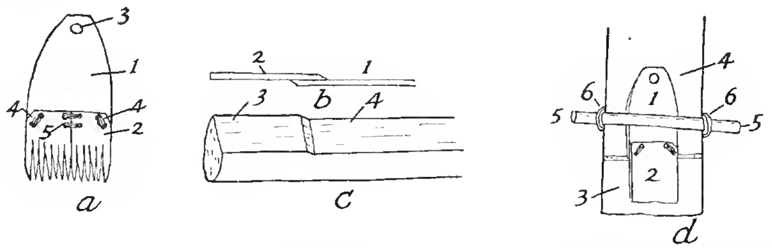


FIGURE 327.—Tattooing comb; shaping teeth: *a,* The turtle shell plate (1) complies with the total width of the bone plate (2) below and curves in above to a width sufficient to take perforation (3) for the handle lashings. The lower edge of the turtle shell plate is bevelled on its posterior surface. The bone and shell plates having been ground down and shaped, are fitted and fastened toegther with the thiek eoconut husk fibres known as *tuatua.* *b,* The lower end of the turtle shell (1) and the upper end of the bone plate (2) are overlapped for a depth of from 9 to 14 mm. according to the type of comb. Referring to (*a*), holes are drilled through the overlapping part, the holes being arranged in pairs so that the turns of the lashing can pass right around. In the narrow eombs, there is one pair of holes on either side usually placed obliquely (4). Each plate is drilled separately after marking the site through the first. The bone plate is in front. When the implement is a wide one, it may take three or even four pieces of bone to form

the width required. The holes are bored as in the outer ends in obliquely situated pairs (4) while the contiguous sides of two sections of plate are lashed through two sets of transverse paired holes (5). The lashing is made with continuous rounds of the *tuatua* fibre which is then tied at the back in a reef knot with the ends tucked away. *c*, While shaping the bone teeth, the plate is fixed by a very primitive but effective vice. A piece of green coconut leaf midrib is cut in the shape shown to provide two planes at slightly different levels which will form a support for the bone and turtle plates now fastened together. The bone plate is measured against the midrib so that its lower edge approaches the free edge of the midrib. Thus the higher surface (3) takes the bone plate (2) and the lower plane (4) takes the turtle shell (1). *d*, Looking down from above, a stick (5) is laid transversely across the turtle shell plate (1) and a thread or cord (6) is wound laterally from side to side over the ends of the stick, the cord keeping on the under surface of the midrib. By making the turns taut, the plate is bound down to the midrib in a vice which prevents movement.

In olden days the teeth must have been cut with thin chips of stone. Nowadays a steel table knife with the edge roughened to act like a saw forms an efficacious instrument. In sawing the bone plate with knife or chip, the plate, from the support it receives on the midrib vice, is not liable to break or snap. The plate is divided into from 1 to 1.5 teeth per millimetre. In shaping the teeth, the two end teeth are always made wider than the others to prevent their breaking off so easily, but the points are made as fine as the others.

In these days, the teeth are sharpened with a piece of school slate ground to a thin edge from both surfaces. The instrument is rubbed between the teeth to sharpen the points and clear the inter-teeth spaces. The length of the teeth is about 5 to 6 mm.

There are four types of tattooing instruments of different widths for different functions.

1. The *au fa'atala*, or *au mono*, is the narrowest instrument. In five instruments measured, the width of the bone plate ranged from 5.5 to 7 mm. and the depth from 22 to 26 mm. The turtle shell plate ranged from 6 to 7 mm. in width and 32 to 45 mm. in depth. The width between the points of the outside teeth ranged from 3 to 4 mm. and the number of teeth from 4 to 6. The overlap between the two plates is from 11 to 13 mm. The implement as its name implies is used for making points (*tala*) or dots. It is also the instrument used for measuring off the commencement of the work on the back. (See Plate LVI, *B*, 7.)

2. The *au songi aso laitiiti* had a bone plate 22 mm. deep and 9 mm. at its widest part. The turtle shell plate was 28 mm. deep and 9 mm. wide. The overlap between the two was 11 mm. The width across the teeth was 6 mm. and the number was 10. The instrument was used for making fine lines.

3. Of six *au songi aso tetele* measured, the bone plate ranged in depth from 20 to 31 mm. and in width from 15 to 20 mm. The turtle shell plate ranged in depth from 30 to 50 mm. and in width from 15 to 20 mm. The width across the teeth ranged between 13 and 17 mm. and the number of

teeth from 14 to 20. The overlap was 11 to 14 mm. The use was for making the wider or thicker lines. (See Plate LVI, *B*, 2.)

4. Of the two *au tapulu* measured, the bone plates were 17 and 19 mm. deep and 53 and 55 mm. wide. The turtle shell plates were 63 and 68 mm. deep and 53 and 56 mm. wide. They were 49 and 52 mm. in width across the teeth and there were 41 and 46 teeth. The overlap between the two plates was 9 mm. in both instances. The greater width of the *au tapulu* is obtained by joining three or four sections of bone together. (See Plate LVI, *B*, 6.) It is used for filling in the field in the dark parts of the tattooing. Of the four types of implement, the *au songi aso tetele* is the one in most use. Though there are four main types of instrument, the artist may have more than one variety of each by using different widths of even the same type.

The handle (*'au*) is made of *fau* and ranges in length from about 9.5 inches in the smallest instrument to 11.75 inches in the largest. The handle is rounded or elliptical in cross section for most of its course. In the smallest instrument it is 0.3 inches in diameter and 0.4 inches in the largest. The proximal end of the handle is cut away on the under surface for 3 to 3.5 inches for about half its thickness. This gives a flat under surface for the grip and renders the handle less liable to roll in the hand during the operation. The distal end is cut away slightly on the under side to form a slot for the upper end of the turtle shell plate. When the plate is fitted in position, its front surface lies flush with the end surface of the handle. Some handles are made of thin bamboo.

The handle lashing forms a neat piece of work. The thicker *tuatua* coconut fibres are used and look like fine copper wire. (See figure 328.)

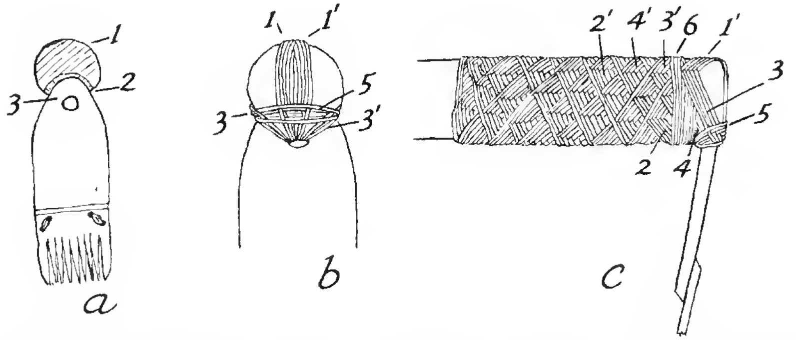


FIGURE 328.—Tattooing comb, lashing of handle: *a*, The end of the handle (1) cut on the under side to form a slot (2) for the curved upper end (3) of the turtle shell plate. *b*, An analysis of the lashing shows that certain turns pass through the hole from the back and pass vertically up over the end of the handle, (1 and 1'). These vertical turns diverge alternately to either side and pass spirally around the handle. Other turns come in from either side (3 and 3') and pass upwards diagonally on either side of the

handle to continue spiral turns to the proximal end of the lashing, whence they return towards the plate. There are thus two sets of turns for either side of the handle and as each turn comes forward from the distal end and then returns, there are really four distinct courses on either side. *c*. The complicated looking lashing is shown from the right side. The courses (3 and 4) show the turns that have passed through the hole from the right side, while (2) shows the turns which after passing through the hole have ascended vertically and turned off to the left. The turns (1′) are vertical turns from the left side which cross immediately to the right. The turns through the left side of the hole are shown by (3′ and 4′) which correspond to (3 and 4) on the right. The turns (2′) are the turns which pass through from the back of the hole and come vertically up the front as the turns (1) in *b*. The arrangement of the order in which they are made results in the series of overlapping figures shown. In addition to the above diagonal turns transverse horizontal turns around the front (5) and vertical turns around the handle near the comb (6) are added to further render the lashing secure. They do not pass through the hole and are also made in proper rotation with the other turns to interlace. The opportunity of getting the correct order did not occur.

Some of the lashings are very simple but the vertical and lateral turns through the hole are the same. In many of the *au tapulu* there are two holes for the lashing. In these, one half of the vertical turns and one set of lateral turns pass through each hole but the principle is the same.

Instrument container. The word *tunuma* which signifies the Samoan container for holding the implements must not be confused with *tuluma*, a wooden box with a lid cut out of the solid and said to have been introduced from the Tokelau Islands. The Samoan *tunuma* is a cylindrical wooden vessel open at both ends as in Plate LV, *B*, 4. This form is made of a section of pandanus trunk which is easily hollowed. An old *tunuma* that belonged to the father of Faioso, the young tattooing artist, has been cut out of solid wood and is wider at one end than the other. This is the characteristic shape of the *tunuma* and not the evenly cylindrical. It was also unique in being covered on its outer side by a close check plaiting of the single thick coconut husk fibres, which overlapped the upper wide margin and descended to within an inch or so of the lower narrower margin. Kramer (18, vol. 2, p.75) figures an example but owing to the human figure carved on the outer side, the container certainly looks as if it belonged to Tonga instead of Samoa. Kramer himself attributes the container to Tonga.

The instruments are packed away inside the container with the teeth turned inwards to the middle. The handles protrude down through the smaller end and are packed round with thin bark cloth inside the container to prevent the combs turning and becoming injured. A number of instruments may be packed away as the combs are turned in at different levels.

The mallet (*sausau*) is made of a piece of dry coconut leaf midrib cut to a length of about 23 inches with cross diameters at the thick end of 0.6 and 0.5 inches. The handle part is cut away like the instrument handles to give firm hold to the fingers and prevent it turning in the fingers. (See Plate LVI, *B*, 5.)

The pigment is prepared from the soot of the candlenut in exactly the same way as for dyeing bark cloth. The material is kept in a coconut shell named *pupu lama* from its use.

A mortar (Pl. LVI, *B,* 1) is prepared from a coconut shell which is cut off above the equator. It is termed the *ipu tu'i lama* as the *lama* soot is ground (*tu'i*) in it. The required quantity of soot is poured into it from the shell container and ground up fine with a wooden pestle (*tu'i*) made of *fau* wood. (See Plate LVI, *B,* 1.) When the dry soot is rendered sufficiently fine, water is added to form a thick pigment.

The palette (*ipu tu'u lama*), is also formed out of a half coconut shell (*ipu*) over the opening of which a *talo* leaf or a *mamala* leaf is tied with a strip of *fau* bast. (See Plate LVI, *B,* 3.) The pigment is dipped up on the pestle and dropped on the improvised palette. In order that the half shell may rest on the ground, the bottom or *muli* is chipped off or the shell may be set up between three stones to keep it level. Nowadays the *talo* leaf is usually tied over the end of an empty beef tin because of its flat bottom.

Vessels. A small wooden bowl containing water is used for the instruments when the operation of tattooing is going on. The handles of the instruments are rested on the ground with the combs leant over the rim of the bowl and their teeth thus submerged in the contained water. As the operator finishes with one instrument, he leans it over the rim of the bowl and picks up the particular instrument he requires. The bowl is not a special part of the artist's kit but is a suitable sized bowl obtained from the household.

Another bowl of water is used for washing and dampening the cloth, serving as sponge or towel.

Towels (*solo*) are formed of old *siapo* cloth (*ta'afi*) that owing to use is frayed and soft. (See Plate LVI, *B,* 8.) A piece is held by the artist wound round the handle of the instrument in use to keep it from slipping. The bare handle is never held.

Another *solo* is held by the assistant. It is usually dampened overnight and is spread over the skin in front or below the part being tattooed. The assistant stretches the skin taut with the *solo.* Every now and again as the artist lifts his instrument, the assistant wipes off the blood and extra pigment with the towel. He then quickly moves it down away from the tattooing edge and turns the cloth to expose a clean part as he sees fit. The assistant is also called *solo* and his main duty is to sponge the tattooing.

Preliminary procedure. For the children of ordinary chiefs (*matai*), the father consults the artist he desires and they arrange the date for commencing the operation. On the appointed day, the artist visits the village and commences work without any ceremonial.

If a chief's son, the father visits the expert and offers a fine mat to seal the bargain. The mat, if accepted, is called the *fusi ta*. The expert, on the day appointed by himself, visits the village and takes a large pig (*le momoli o le tufunga*) as a present to the family of the patient. The pig is divided up amongst the chiefs and talking chiefs of the village. The act of respect adds greatly to the expert's social status, especially if he is a commoner. A speech (*launga*) is made to the expert by the village talking chief and appropriate references are made to the craft of tattooing. The ceremonial drinking of kava takes place and the tattooing artist has the honor of the first cup. By virtue of his occupation, he ranks with builders as the companion of kings (*angai o tupu*). The usual feast follows. If all the ceremonial takes place in the morning, the expert may commence tattooing in the afternoon, but if too late, he announces to the gathering that work will commence on the morrow.

TATTOOING MOTIFS

Samoan tattooing is rectilinear. The surface covered is divided into areas with its boundaries and orthodox form of treatment. Each area is done in regular order. A number of thicker lines or bars are spaced over the back and each has its proper name. Between the bars and in other areas various forms of lines and secondary motifs are used which also have their names. The secondary motifs may be introduced into panels set in the wider dark bars or areas. It will help the study to enumerate the various secondary motifs with their names and forms.

Lines. The general name for lines is *aso,* whether they are used as motifs themselves or to form boundaries. When acting as boundaries of an area they receive a specific name associated with the area or their function. As a motif they are divided as in figure 329.

The term *fa'aila* is applied to some smaller motifs let into the dark areas formed with the *au tapulu* instrument in the wide bands on the back or any of the filled in parts of other areas. To define it, a rectangle is usually formed first which is enhanced in various ways and the part outside the rectangle is then filled in solid. A birth mark or a spot on the skin is termed *ila*. The term *fa'aila* has come to mean window and it is more in this sense that it is used in tattooing. A rectangle set in a dark band or dark area is compared to a window-like opening set in a dark wall. The use of the term is fairly modern. Therefore, as applied to tattooing it marks the period of greater enhancement and decoration in the craft. Where the older school had plain bands and dark areas, the younger school lightens them up by the introduction of *fa'aila*. The motif within the *fa'aila* rectangle may consist of any of the smaller motifs. If a motif is sufficiently large and striking in itself, it may be introduced into a dark area without any surrounding rectangle. The motif

will then show up as an untattooed part in the dark area and carry its own name.

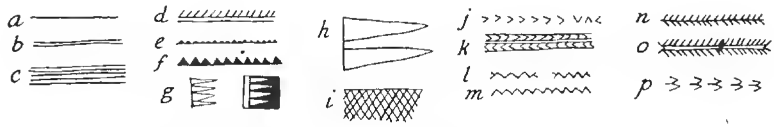


FIGURE 329.—Men's tattooing motives: *a, Aso*—any single line. *b, Aso moelua*—two parallel lines close together. *c, Aso laitiiti*—small or thin lines when more than two run close together parallel. The above lines are all simple but there are two that receive modification. *d, Aso fa'atala*—short parallel oblique lines representing *tala* (thorns) are added to one side of the line with the narrow *au fa'atala* instrument which was made for such purposes. *e, Aso tongitongi*—thicker marks as dots or points make the line an *aso tongitongi*. Larger triangular points may be added to a line or an edge and divided into two kinds according to size. *f, Fa'alaupaongo* (made like the leaves of the pandanus) which give a distinct well-marked saw-tooth edge owing to the larger size of the triangles and are thus distinct from the *aso tongitongi*. *g, Fa'asingano* (made like the male pandanus flower), the triangles of which have a narrow base and longer sides and are thus likened to the long sharp petals of the flower. *h, Fa'amuli'ali'ao* (made like the apical whorls of the *Trochus niloticus*) are the very large triangles characteristic of the back of the thigh. They require space and cannot be used in embellishing smaller areas. Much confusion, however, occurs, and some artists may call small triangles *fa'amuli'ali'ao*. The proper distinction is that given above. *i, Fa'a'upenga* (made like a net). The cross-hatching of diagonal lines resembles the meshes of a net and is hence given that name. As a tattooing motive it occurs only on the *punialo* unit above the pubes. *j, Vaetuli* or *vae'ali*. There are short individual chevrons generally arranged as in the figure with their points facing in one way. *Vae* is leg, and *tuli*, the knee. *Vaetuli* is thus the knee of the leg and refers to the bend of the knee. *Vae'ali* is an alternative name for the same motive and means the legs of a bamboo pillow. *k, Aso fa'avaetuli*. If two parallel lines have the *vaetuli* motive placed between them, the lines are called *aso fa'avaetuli*. If two such sets are placed close together then the word *moelua* (to sleep in twos) is added to distinguish the pair. Zoomorphs are rare as regards number, but there are three that are much used in tattooing for extra decoration and enhancing spaces or panels. *l*, and *m, Anufe* (caterpillar). The caterpillar is merely a zigzag line. If short lengths are used as in *l* a short stroke is added at either end. Sometimes long lines are formed as in *m*. The caterpillar motive may be used in wide dark bands by making parallel zigzag lines and then blocking in the field to the outside of them. This forms a light caterpillar motive on a dark ground. The dark band which has its own specific name has the motive name with *fa'a* preceding it to denote the type of dark band. Thus, if the *tafani* dark band is internally enhanced with a light *anufe*, the band is called *tafani fa'aanufe*. *n* and *o, Atualoa* (centipede). The centipede is like the *aso fa'atala* (*d*) but with *tala* lines added to the other side as well. When bilaterally treated it becomes *atualoa*, the short lines representing the legs of a centipede. A single line may be used as a body (*n*) or a double line may represent the body (*o*). In the latter case, a couple of short lines are added to one or both ends to represent the head or head and tail. *p, Ngongo* (tern). The tern motive is commonly used as an enhancing element in panels and triangles. It is merely an M with the side limbs diverged outwards and the middle point produced. The motive may face in any direction.

THE OPERATION

Measuring the back (*ano le tua*). Apart from the execution of detail, a person's tattooing is judged by the height at which the lines from the top

corners of the canoe motif on the back, come forward round the sides of the ribs. They may be too high or too low and disparaging remarks are made accordingly concerning the artist's skill. The first process, therefore, consists of marking out the commencing motifs on the back as in figure 330.

The tattooing takes place in a house set aside and generally with the wall screens let down on the side facing the public street. The father and local chiefs are present at the initial steps. The patient kneels on both knees with his back towards the artist and the light. He is instructed to keep the back straight and rigid with the head up, elbows bent slightly out from the sides and forward with the hands clenched and raised. The artist has all his instruments arranged beside him with the combs resting over the rim of a bowl of water. The prepared pigment is on the *talo* leaf palette. The tattooing artist, Faioso, demonstrated the whole process on a young man. To get the first line he used what he termed *mafaufau* (judgment). He could give no anatomical landmarks or approximate measurements of the parts of the body to get the level. No, it was a question of *mafaufau* that came through serving an apprenticeship to a master craftsman. It was easier to draw the line than to explain exactly where it should be drawn. The same *mafaufau* persists throughout the operation.

The six lines completing the measuring (*ano*) of the back (*tua*) finished, the patient stands up and shows his back to his father and the other chiefs present for their approval. A discussion takes place as to whether the position of the figures is too high, too low, or correct. If agreed to at once, the actual tattooing commences immediately. If not agreed to, further argument and discussion take place, the artist naturally adhering to his opinion as expressed by the marking. A difference of opinion is termed *utunga lua*. When unanimity prevails, the tattooing proceeds.

A large roll or bundle of bark cloth is laid on the floor and the patient lies chest down with the fold under his abdomen. The fold thus elevates the small of the back and stretches the site of the operation. The artist sits on the head side and the assistant on the opposite side towards the legs. The artist uses the mallet with his working hand so the other hand which holds the tattooing comb must be on the side nearest the patient's body. (See Plate LVI, *A*.) The artist rolls a piece of bark cloth loosely round the hand, takes up the appropriate instrument for making lines (*au songi aso laitiiti*), dips the points of the comb in the pigment, lays the points on the right end (from himself) of the base line (fig. 330, *a*, 1) and gives it a sharp tap with the mallet. He lifts the comb to continue a connected line and with quick taps he soon runs the line across. The hand with the mallet is held a little distance away so that it is the end of the fairly long mallet that strikes the handle of the instrument above the comb. The tapping is by finger and wrist movement. The swing of the mallet end describes quite a long arc and the tap is made

smartly, firmly, and with precision. Three different patients were seen being tattooed and the long arc described by the mallet and the quick confident movements were what impressed me most. The hand holding the comb rests on the patient's body and so maintains accuracy in placing the teeth. The assistant holds the dampened bark cloth towel over the body just below the line of the tattooing and every now and again between strokes or whilst the artist is dipping the comb in the pigment, the towel is lifted up over the site of tattooing and pressed down to soak up blood and extra pigment. As the towel is pulled back, the assistant keeps the skin stretched with the hands outside the towel.

The back motifs are filled in as shown in figure 330 *b*. Before filling it in, however, certain motifs are made as in the *pula tele* to relieve the wide dark band. The right side of the intermediate lines, the *pula tele* and the canoe are then made symmetrical with those of the left.

The younger generation of tattooing artists maintain that they do better work than the older school because they introduce more ornamentation lines and break up the monotony of the wider dark bands. This is best shown by taking the simpler older design in figure 330 *c*, copied from Kramer (18, vol. 2, p. 77, fig. 4) and comparing it with Faioso's work.

The enhancing of wide bands by the modern school is shown in figure 330 *d*.

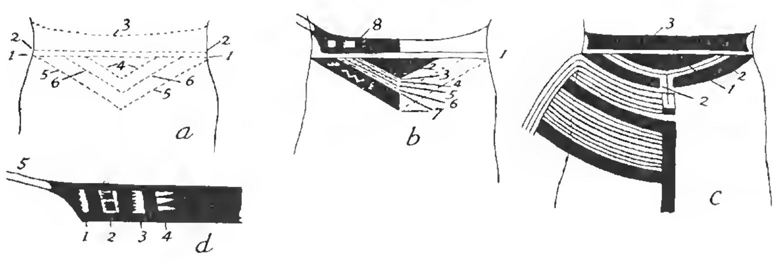


FIGURE 330.—Tattooing; commencement (back): *a*, The first line drawn was *le aso o le pula* (the line of the *pula*) which corresponds to Kramer's *aso fa'alava* (18, vol. 2, p. 77). The artist picked the narrowest instrument (*au fa'atala*) and dipped the side of the comb into the pigment. With the side of the instrument, he made a series of short lines in the horizontal direction (1). The artist laid both hands over the patient's hips and held him steady while he scrutinized the level and straightness of the line. The second line (2) was made slightly above and parallel with it to form the lower limits of the *va'a* (canoe). A little distance above that, the third line (3) forming the upper limits of the canoe was marked off. The outer ends curved slightly upwards. These lines are afterwards curved forward to form the *fa'aulutao* which form the subject of criticism mentioned. *Fa'aulutao* means to make like the head (*ulu*) of a spear (*tao*). The fourth line (4) commences from the first line to the left of the middle line and descends obliquely to the middle line. From there it ascends to a point equidistant from the middle line on the right. This forms a triangle base upwards and marks the lower limits of the figure known as the *pula tama*.

Then follow the lines (5 and 6) made parallel with the fourth lines (4) but both starting from the base line (1) on the left and finishing at points on the right that are equidistant from the spine. The outer ends of line (5) correspond practically with the continuation downwards of the post-axillary line. The figure is known as the *pula tele*. *b*, The base line (1) is completed and the lower lines of the *pula tama* triangle (2). The triangle is then filled in (*tapulu*) with one of the wider combs. Between the triangle and the upper line (*a*, 6) of the *pula tele*, the space is filled in as the taste of the artist or the patient directs. In this case, there is first a line of dots (*tongitongi*) as (3), then two *aso tongitongi* dotted lines (4 and 5) followed by another row of *tongitongi* dots (6). This covers the space and the boundary lines of the *pula tele* (7) are made and the part between filled in (*tapulu*). Before filling in certain figures are formed to relieve the monotony of a plain wide band.

In filling in the above, only the base line and the *pula tama* triangle were completed. All below the triangle were made on the left to the middle line. The left half of the canoe (8) is also filled in. *c*, The canoe (3), *pula tama* (1) and *pula tele* (2) are all plain and unrelieved by any introduced motives. Between the *pula tama* and the *pula tele*, there is only one sigle line, whereas in *b*, there are two lines of dots and two serrated lines that from the point of view of the younger Samoan give greater decorative effect. *d*, Enhancement of the left side of the canoe (*va'a*). Here the large serrations (1 and 3) are known as *fa'atala laupaongo* (spiked like pandanus leaves). The rectangular figure internally enhanced (2) is the *fa'aila* already mentioned. The long, narrow triangles (4) are known as *fa'asingano* (made like the long petals of the male pandanus flower). Any variety of motives may be introduced in a dark field and the general term for such treatment is *fa'aila*. The outer lines (5) are the *fa'aulutao* lines that run from the upper angles of the canoe around to the front of the body.

Lower back motifs. The artist works on until he considers that he has done enough for the day or stops earlier if the patient shows signs of excessive pain and exhaustion.

From the *pula tele*, the tattooing works down on the left in the middle line. To the outer side, the motifs extend out to about the post-axillary line. When a certain amount has been done on the left side, the right side is done in the same way so as to make the design bilaterally symmetrical. The order of motifs in one of Faioso's designs is shown in figure 331.

The parts between the wider bands are filled in as the artist pleases. There is no set rule as to the number of finer lines between the wider bands. Thus in the simple design in figure 330 *c*, they are filled in with a varying number of fine parallel lines (*aso laitiiti*).

Owing to the lower oblique lines of the *pulatama* triangle (the upper part of the patterns) the lines of tattooing run obliquely outwards and upwards from the middle line of the spine. The second *tafani* runs out to about the anterior superior spine of the ilium. In some designs, a wide vertical band called the *ivitu* is run up the middle line to divide the two sides. In any case, the two sides diverge towards the lower end owing to the anatomical separation of the gluteal muscles. As the divergence takes place, the part between is filled in with solid tattooing (*tapulu*) for as far as is convenient.

Some artists work down as far as the second *tafani* and then complete the anterior side margins (*aso fa'aifo*) but others keep on down to the solid thigh *lausae* as described. When the latter course is pursued, the tattooing

stops at about the mid-axillary line and cannot be completed until the anterior margins are dealt with.

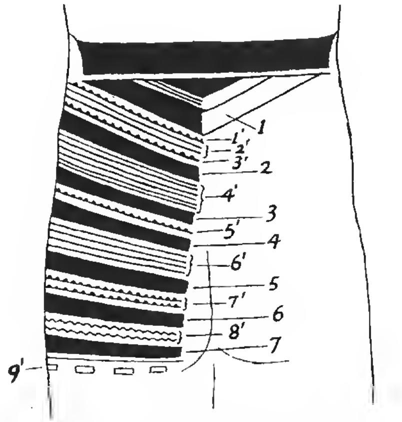


FIGURE 331.—Tattooing; elements of design (back). It will be noted that the wider bands working down from the *pula tele* (1) are two *tafani* (2, 3) and three *saemutu* (4, 5, 6). These are evenly spaced and have a fixed order, but they may be decorated with *fa'aila* motives. If the patient is tall it may be necessary to add a fourth *saemutu* to fill in the space. An analysis of the more decorative design in the figure is as follows: (a). Between *pulatele* (1) and the first *tafani* (2). Serrated line (*aso tongitongi*) (1'), two lines (*aso moelua*) (2'). Serrated line (*aso tongitongi*) (3'). (b). Between first (2) and second (3) *tafani*. Six thin lines (*aso laitiiti*) (4'), (c). Between the second *tafani* (3) and first *saemutu* (4). One serrated line (*aso tongitongi*) (5'). (d). Between first (4) and second (5) *saemutu*. Four thin lines (*aso laitiiti*) (6'), (e). Between second (5) and third (6) *saemutu*. Two serrated lines (*aso tongitongi moelua*) (7'). Below the third *saemutu* is a combination of two zigzag lines (*fa'anufe moelua*) (8') and a wider plain band (7) which are collectively referred to as the *aso talitu*. The *aso talitu* forms the end of the buttock design. Just below it is the solid tattooing of the thigh called *lausae* but just within the latter boundary are a few introduced *fa'aila* known as *fa'aila tautau* (9'). This brings us to the lower level of the gluteal area.

Figure 332 shows a very elaborate back design drawn by Faioso himself in pencil and copied in the figure in every detail.

Front of the body. The lines (*aso*) terminating (*fa'aifo*) the design on the anterior part of the body are curved forward from the end of the back base line and descend on the anterior surface of the abdomen to meet the *punialo* unit of the design. The *punialo* is a triangular unit in the middle line with the base upwards and the apex resting on the pubis, the point being indeterminate and lost as it were in the pubic hair. It is usually tattooed in youth some years before the age of regular tattooing is reached. In modern times, it is used as a test. Young men desiring to be tattooed, yet fearful of the pain, have the *punialo* tattooed and if they can stand the pain, they go on with the full tattooing later. Many young men are to be seen with the *punialo* unit alone. They could not summon up the courage to go on with the major operation. This, of course, exists in modern times when youth can please itself. In olden

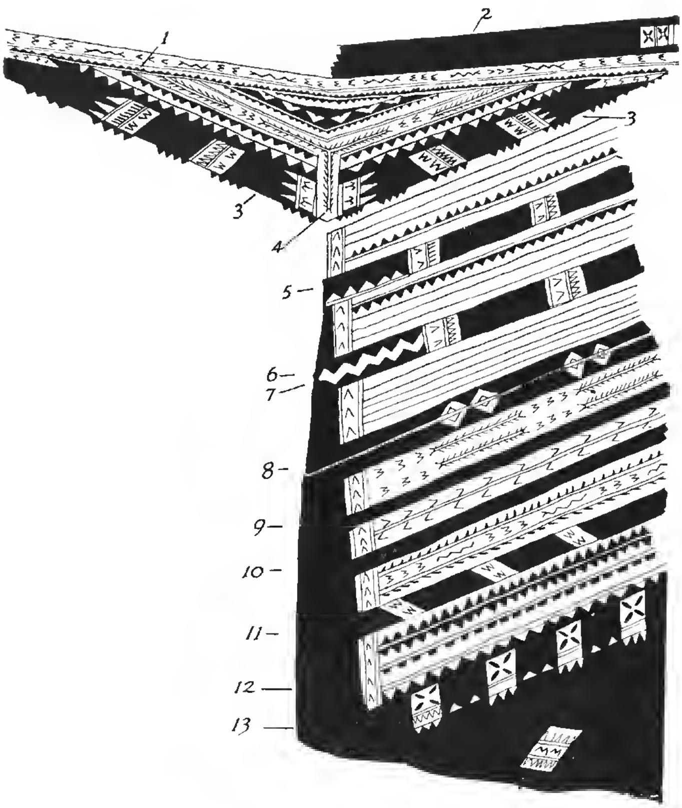


FIGURE 332.—Tattooing, back designs drawn by the young tattooing artist, Faioso. The base line (1) is serrated and between it and the canoe (2), tern, caterpillar, and bent knee motifs are introduced. The *pula tele* (3) is enhanced with *fa'aila* and with the *fa'alaupaongo* triangles forming saw tooth edges. The *pula tama* is hardly recognizable and between it and the *pula tele,* the large centipede and tern motifs are introduced. The centipede (4) also separates the two arms of the *pula tele* in the middle line. The first (5) and second (6) *tafani* bands are enhanced with two *fa'aila* and the inner end of the second *tafani* is made with large alternating triangles that form the large caterpillar (*anufe*) motif between. The caterpillar motif (7) is so outstanding that the *tafani* is termed *tafani fa'aanufe.* The first *saemutu* (8) dark band is made in two parts in such a way as to form two pairs of lozenge shaped *fa'aila* with a clear line bisecting the band. The two succeeding *saemutu* (9, 10) are fairly narrow plain bands but the spaces above, between and below are filled in with various motifs which have replaced the parallel plain lines of the older designs. The last *saemutu* (11) has 3 oblique *fa'aila* and the *talitu* (12) ends in 2 thin lines with large *fa'alaupaongo* points projecting downwards towards the 4 *fa'aila* below it.

times, tattooing was necessary for a chief to hold his status, as an untattooed chief was a thing unheard of. The formation of the *fa'aifo* and the continuation of the back motifs round the sides to the front are shown in figure 333.

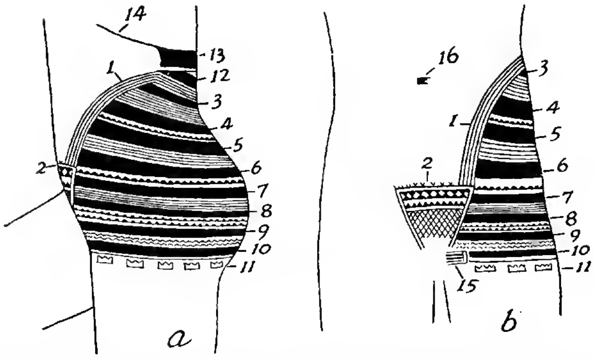


FIGURE 333.—Tattooing design, side and front of body: *a*, side view; the outer line of the *aso fa'aifo* (1) curves forward from the posterior axillary line and descends to meet the base of the *punialo* (2). The *fa'aifo* lines, making four or five altogether, are made parallel and so arranged that the outermost coincides with the angle of the base of the *punialo*. The lines correspond to a continuation of the upper lines on the back between the *pula tele* (12) and the first *tafani* (3). The *fa'aifo* lines may be plain as in the figure or serrated with points. The innermost of the *aso fa'aifo* lines forms the anterior boundary of the tattooing as far as the *punialo*, the sides of which continue the boundary below. If the *punialo* has not been already tattooed, the *fa'aifo* lines are carried down to the approximate position of the *punialo* which is left to the last. With the patient lying on the opposite side, the motifs from the back are continued outwards until they meet the *fa'aifo* lines and are thus closed. In the design shown, the first and second dark *tafani* bands (3, 4) and the first and second *saemutu* bands (5, 6) reach the *fa'aifo* lines. Two more *saemutu* bands (7, 8) are shown reaching the side of the *punialo* triangle while yet another *saemutu* band (9) with the *talitu* (10) are shown following in their respective order. The *fa'aila* motifs (11) follow below the *talitu*, while the canoe (13) with the *fa'aulutao* line (14) are shown above. The plain, dotted, and zigzag lines between the darker bands are continued on from the back. *b*, Front view showing *fa'aifo* lines (1) meeting the upper border of the *punialo* (2); the two *tafani* (3, 4) and two *saemutu* (5, 6) meet the *fa'aifo* lines; the three lower *saemutu* (7, 8, 9) are shown meeting the side of the *punialo* while the *talitu* band (10) meets the *selu* comb (15) opposite the scrotal attachment; the *fa'aila* motifs (11) are continued to the front. The form of the *punialo* (2) is shown with the *vaetuli* (bent knee) motif on the base line, two rows of *fa'alaupaongo* (pandanus thorns) with their points meeting to form lozenges, a row of pandanus thorns with their points upwards and the rest of the triangle filled in with cross hatching (*'upenga*). The filling in over the navel (16) is shown though it is not done until the finish of the full tattooing.

Back of the thigh. With the patient on his face, the upper boundary of the thigh is formed by the *talitu* and the line of *fa'aila tautau* already tattooed and corresponding practically with the lower fold of the gluteus muscle. The popliteal space at the back of the knee is a special region (*atingivae*) bounded by a transverse line above the level of the joint. A little to the inner side of the middle longitudinal line of the thigh, a line termed the *aso fa'amuli'ali'ao* (*aso*, line; *fa'amuli'ali'ao*, long narrow triangle motif) is tattooed from the transverse line above the knee joint to a point below the gluteal fold. This important line divides the back of the thigh above the popliteal space into outer and inner areas. As the name indicates, the line forms a base upon

which the *Trochus* (*'ali'ao*) shell triangular motif is introduced. The long narrow triangles are made singly or in pairs (*moelua*), with their bases formed by the longitudinal line and their apices directed outwards. The spaces between the triangles are filled in solid (*tapulu*) and are included in the outer area (*lausae*) which is continued outwards to the front of the thigh. The inner area is filled in with lines parallel with the longitudinal boundary line and like it are termed *aso fa'amuli'ali'ao*. The inner back area of the thigh receives no special name, the name of the dominant line motifs being evidently considered sufficient. The treatment of the two posterior thigh areas and the popliteal space is shown in figure 334.

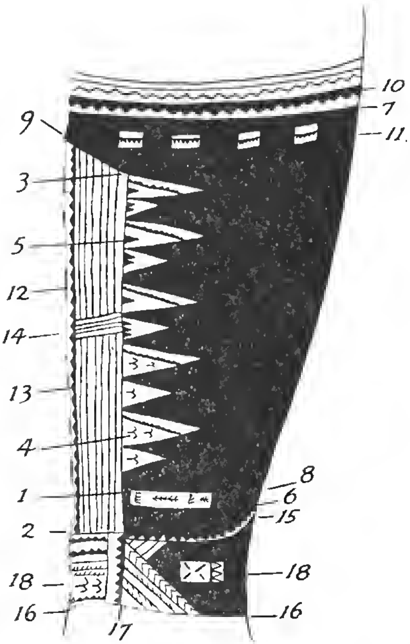


FIGURE 334.—Tattooing design; back of thigh and knee (*fa'amuli'ali'ao, lausae,* and *atingivae*). Back of right thigh. The already tattooed area of the back ends in the *talitu* band (10) and the *fa'aila* motifs (11). The longitudinal line (1) termed *aso fa'amuli'ali-'ao* extends from the line (2) above the knee joint to the point (3) below the gluteal fold. On the base line (1), a number of long, narrow triangles (*fa'amuli'ali'ao*) are made with their apices directed outwards to the right. In the design the triangles are made in pairs (*fa'amuli'ali'ao moelua*), the lower triangle of each pair being smaller. The triangles are enhanced internally by serrated lines, by the tern motif (4) in the lower two pairs, and smaller triangles (5) in the upper three pairs. The spaces between the triangles are filled in solid (*tapulu*) with the *tapulu* instrument and the dark tattooing extends outwards to fill in the outer *lausae* area. Below, the *lausae* area is defined by the serrated line (6) which extends outwards from the transverse line (2) and curves upwards on the outer side of the thigh. Above, the *lausae* is defined by a line (7) made between the *talitu* (10) and the *fa'aila* (11). An ornamental horizontal panel (8) is outlined below and to the right of the lower pair of triangles. The *lausae* area on the back is filled

in with the *tapulu* instrument between the boundaries mentioned and the *fa'aila* elements (11) thus show up as little windows in the dark area. The *lausae* area is filled in as far as convenient and its extension to the front is dealt with later. The inner back area is dealt with by making the oblique line (9) as an upper boundary. The space above the oblique line (9) is filled in solid as far as the upper boundary line (7) of the *lausae*. From the original boundary line (1), parallel longitudinal lines (*aso fa'amuli'ali'ao*) are made as far as the inner margin (12) of the thigh and bounded above by the oblique line (9) and below by the horizontal line (2). Near the inner margin, one of the longitudinal lines is enhanced by the serrated motif (13). The longitudinal lines are interrupted (*fa'amotumotu*) by a panel of horizontal lines (14), introduced to break the monotony of the long lines.

The popliteal area (*atingivae*) is bounded above on the inner side by the transverse line (2). To the outer side the upper boundary is indicated by the serrated lower border (6) of the *lausae*, but a plain line (15) is made parallel with it and curving upwards at the outer end. The upper boundary of the *atingivae* is very slightly above, or corresponds with the line of the knee joint. The lower boundary is formed by a line (16) running transversely across below the joint level. In the figure design, the *atingivae* area is treated by forming a serrated vertical line (17) from the line (1) supporting the triangles. The inner side is treated as the artist thinks fit with a vertical plain line and horizontal lines, plain, or serrated, with perhaps the tern (18) or other motif introduced. The tattooing elements of the inner side of the *atingivae* are continued on the inner surface of the knee and their boundary defined when the patient is turned into a more convenient position. To the right side of the serrated line (17) a series of diagonal lines fill in the lower corner and an opposite series of diagonals cross the upper corner. External to the diagonal lines, a *fa'aila* element (18) is outlined and the remaining portion filled in with the *tapulu* instrument.

Front of the thigh. The back of the thigh having been dealt with and the tattooing complete from the canoe motif on the back to the *atingivae* behind the knee, the patient is turned to lie on his back. The lower boundary of the completed tattooing (see fig. 333 *b*) is formed by the anterior continuation of the *talitu* base which ends internally in the comb (*selu*) motif. A certain amount of the outer surface of the thigh has been dealt with from the back. The serrated lower border of the dark *lausae* area is brought around to the front and continued obliquely upwards to the inner side of the *lausae*. The inner anterior part of the *lausae* area is termed the *auanga* and is embellished with long panels (*fa'aila o le auanga*). The remaining area is filled in with the *tapulu* instrument. The dark *lausae* area thus extends over the back, outer side, and front of the thigh, being bounded above by the *talitu*, on the back by the longitudinal line carrying the *Trochus* (shell) triangles, and below and anteriorly by the line above the *atingi vae* which is continued upwards and inwards over the front of the thigh. The large dark area so formed has been referred to as the *tapulu* by Marquardt (20), and Handy (14), and it is so termed at times by the Samoans. The use of the term *tapulu* refers to the dark filling in with the *tapulu* instrument. All the wider bands, the canoe, *pula tama, pula tele, tafani,* and *saemutu* are filled in with the *tapulu* instrument which, from its size, fills in the space more quickly. While the large thigh area may be termed *tapulu* from the extensive use of the *tapulu* instrument

and method, it is regionally known as the *lausae* and the *auanga* is a special part of it.

The part between the *lausae* and the longitudinal lines on the inner side of the back of the thigh is divided into two areas by a line which rises on the outer side of the knee cap ligament and runs obliquely upwards to the inner part of the thigh. The outer of the two areas is the *fusi* (belt) and the inner is the *ulumanu* (bird's head). The belt area is continuous with the outer part of the *atingi vae* or popliteal area. The line of tattooing ends below the knee joint. The manner in which the three areas of *lausae, fusi,* and *ulumanu* are dealt with is shown in figure 335.

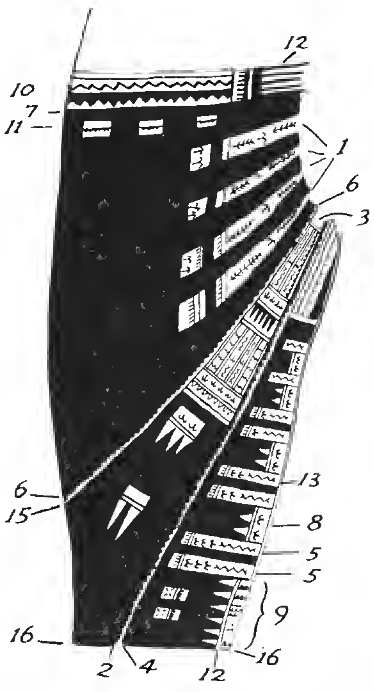


FIGURE 335.—Tattooing design; front and inner surface of thigh (*lausae, fusi* and *ulumanu*). Front of right thigh. The completed *talitu* (10), *fa'aila* (11), and comb (12) are shown, forming the upper boundary of the *lausae*. The serrated lower boundary (6) of the *lausae* is carried around the outer side of the thigh to the front and continued obliquely upwards to the inner side of the thigh. The zigzag line from its function is termed the *aso o le lausae.* The four long panels (1) with detached outer ends are marked in and in order to balance the space, the outer ends are much wider than the inner. They are enhanced internally with plain and serrated lines, tern and centipede motifs. The upper line (7) is then continued from the back to form the upper boundary and the whole area filled in solid. The *fa'aila o le talitu* (11) and the *fa'aila o le auanga* (1) thus stand out in a dark background.

The belt area (*fusi*) is defined above by continuing the plain line (15) from the back, upwards and parallel with the serrated margin of the *lausae.* The line is termed the *aso o le fusi* and is a continuation of the external upper boundary line of the popliteal area.

The lower boundary of the belt is formed by continuing the lower boundary line (16) of the popliteal area around the outer side of the knee and then with a slightly upward inclination to about the level of the attachment of the knee cap to the shin bone (*tibia*). Just on the outer side of the knee cap ligament, the serrated line (2) termed *aso o le tuli* (line of the knee) is carried obliquely upwards and inwards to gradually approach the other boundary line (15) at the upper end. From the upper and lower boundaries, the belt area is a continuation anteriorly of the outer dark part of the *atingivae*. The upper part of the belt area is filled in with panels (3) which owing to the narrowness of the area are continuous and not laterally spaced as in those of the *auanga* (1). The panels are internally enhanced as shown and in the middle and lower parts of the area, smaller *fa'aila* panels are made to break the dark color which is filled in and becomes continuous with the outer dark part of the *atingivae*.

The birds' head area (*ulumanu*) consists of the remaining portion between the belt on the outer side and the innermost longitudinal line (13) on the back of the thigh termed the *aso o le atingivae*. The lower boundary is formed by bringing the lower border line (16) of the popliteal area around the inner side of the knee and inclining it slightly upwards to meet the inner boundary of the belt on the knee cap ligament. A line (4) termed the *aso o le ulumanu* (line of the birds' head) is made parallel with the serrated border (2) of the belt. The birds' head area defined by the lines (4) and (13) is carefully enhanced with spaced horizontal panels (5) extending across the area from the inner border. The panels are internally enhanced with centipede, caterpillar, tern and serrated line motifs. Between the panels, lines parallel with the inner border form vertical panels (8) internally enhanced in a manner similar to the horizontal panels. From the outer line of the vertical panels triangular pandanus leaf edge or pandanus male flower motifs are formed with their apices directed outwards. At the lower end of the area, the motifs of the inner part of the *atingivae* (See fig. 334) are carried forward on the inner side of the knee (9) and are ended by two vertical plain lines (12) with pandanus male flower triangles to their outer side. Two *fa'aila* rectangles are formed to the outer side again, and the rest of the area not occupied by panels or *fa'aila* is filled in with *tapulu*.

It is natural to assume that tattooing as serving a decorative purpose, receives more attention in the parts that are likely to meet the eye. Of the thigh areas described, the upper and external parts are the least artistic while the lower front, inner, and back parts receive considerable attention in the use of various motifs.

The Samoans themselves give the reason that the darker upper area is covered by the kilt but that in sitting cross-legged in the kava circle and meetings with the kilts tucked up to free the knees, the lower anterior and inner surfaces of the thighs with the belt and bird's-head areas were well exposed. Good tattooing had thus an excellent chance of being displayed and admired. The *Trochus* (shell) triangles and the *atingi vae* were seen from the back and the common habit of wearing the kilt short at the back appears to originate from the natural vanity of displaying the decoration of those areas. The extra attention to detail by the younger school is well shown by Faioso's chart of the thigh areas. (See figure 336.)

The pubic area (*punialo*). The term *punialo* under the form of *pungialo* has been given by Handy (14, p. 26) as a white sea bird, but her informant must have mixed it up with the *ngongo* or white tern motif. It has been seen that the *aso fa'aifo* lines descend to terminate or form the boundaries of the

back patterns when produced forward. They descend towards the pubis on either side. The middle part of the abdomen between the descending lines is the *alo* or belly. The tattooed triangle base upwards is put in to close (*puni*) the (*alo*) space and hence the name of *puni alo*. From its name, the *punialo* was probably at one time always filled in last of the important areas but later became used as a primary endurance test though the name is quite applicable when made by itself.

A pattern is shown in figure 333 *b*, 2. Serrated lines and other motifs may be used and it is for filling in the interior of the triangle that the cross-hatching termed *fa'a'upenga* (like a net) is used. After finishing it, any side lines that fall short are produced to reach the sides of the triangle.

THE NAVEL

The tattooing was finished with a mark made over the navel (*pute*) which showed that the work was done. (See figure 333 *b*, 16.) To the

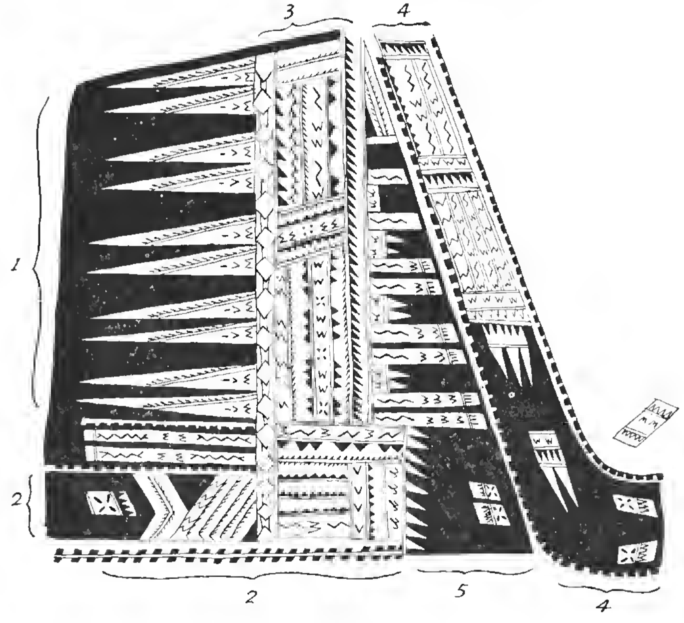


FIGURE 336.—Tattooing designs, thigh and knee. (Drawn by the tattooing artist Faioso).

The back of the left thigh, with the inner and part of front areas spread out. The vertical panel (3) instead of the usual plain *aso fa'amuli'ali'ao* parallel lines is formed of spaced longitudinal lines, serrated and enhanced by triangles and with various motifs introduced. To the left are very long *Trochus* (shell) triangles (1) arranged in pairs (*moelua*) of the same length. The *atingivae* (2) is narrower on the left and much deeper on the inner side which is continuous with the birds' head area (5). The belt area (4) shows the elaborate longitudinal panels.

tufunga it was the last tap of the tattooing comb but to the patient it was the symbol of endurance and manhood, for no youth gets the navel mark until his full tattooing is completed.

VARIATION IN DESIGN ELEMENTS

From following the tattooing operation through its various stages, what appears complicated on first glancing at a completed design is really simple when dealt with in areas. Though the expert relies on *mafaufau* (experienced judgment), he makes use of anatomical landmarks by judging distances between points though he may not be able to express himself in words. A certain area has to be filled in and if the back is extra long an additional *saemutu* band fills the space. The lines are straight though some may show a curve from following the body contour. The *aso fa'aifo* curving in from the side to the pubis, the lines of the belt, and the bird's head over the front of the thigh show some curve, but there are no great difficulties involved. It may be said that the boundaries of the sectional areas are the same in all designs. The variation occurs in the different decorative treatment of the thicker bands, the dark areas, and the enhancement between the main lines of the design. There is much difference in appearance created even by using a serrated edge to the inner anterior boundary of the dark *lausae* as compared with a straight edge. In the wider bands of the back, the addition of *fa'aila* motifs at the ends of the canoe and the various bands makes considerable difference. Unenhanced bands are simply referred to by name but when specially treated receive the name of the motif as a qualifying word with *fa'a* preceding the motif. Thus the second *tafani* band in figure 322, 7 is enhanced with a large caterpillar motif, and the band is termed *tafani fa'aanufe*. Similarly, the addition of caterpillar, centipede, and other motifs between the main bands depend on the artist. Some are certainly an improvement while others have a tendency to become overdecorative and thus confuse the main lines of the design. These enhancements are secondary additions and should be considered in a full design in their proper proportion. In old time tattooing, the design was probably in the nature of figure 330, *c* throughout; the wide bands being unrelieved by *fa'aila* or other motifs, and the lines between the bands simply parallel thin lines placed close together.

The more elaborate the design, however, the longer it takes to complete. Thus, a straight line is quickly made with the wider implements, but if the line has to be serrated, it has to be gone over again with the narrowest comb. Every enhancement within a band, or on the dark spaces, takes extra time and care and the artist has to be paid accordingly; not only has to be paid more but he also eats more food. Hence enhanced designs may only be secured by those who can pay. The skilled *tufunga ta tatau* were like their confreres of the building guild. They created more elaborate design for those who could

pay and as they were the chiefs, the chiefs naturally had more ornamental designs than those of lesser rank and wealth. In olden days, rank and wealth were synonymous so no mistakes were made. Now they may be divorced, but the artist of the comb like his brother artist of the adz will do his finest work where the food is best and the reward most substantial.

Handy (14, p. 21) describes a difference in the *aso talitu* of a chief and a talking chief. I received no information, but the statement conforms with the general policy of the Samoan talking chiefs. They were the councillors and advisors. They seem to have deliberately created a number of artificial distinctions between themselves and the high chiefs in order to flatter them. When it came to material advantage in the distribution of food and fine mats, the distinctions still existed but the material advantage was on the side of the talking chiefs. Though some such distinction may have been created as a political move by talking chiefs, as regards other distinctions in special parts of the design being reserved to districts, these are more likely, if they occur, to have developed with a craftsman and a school rather than that districts used special designs as a particular badge. The craftsmen used the designs they had been taught or to which they added extra decoration and went wherever their services were paid for.

A number of names of different parts of the tattooing design have been erroneously put on record owing to the modern Samoan tendency to use *k* instead of *t* and *ng* instead of *n* in their present spoken speech. Such words as *kapulu, pungialo, sai muku* and *kafangi* should be *tapulu, punialo, saemutu,* and *tafani.*

The small triangular motif (*pula tama*) below the canoe on the back is also given as *pe'a* (flying fox) by Handy (14, p. 26). Pratt gives *umangi* as the tattooing on the lower belly, which must be an alternative for *punialo.* Marquardt (20, Taf. IV, 13) gives *fa'a vala* as the name of the *fa'aila* motifs on the inner anterior surface of the thigh, known as the *auanga* part of the *lausae.* The wide bands on the back below the *tafani* were given to me by Faioso as *saemutu* but both Marquardt and Handy give it as *saimutu* and *saimuku.*

The meanings of *pula, tafani,* and *saemutu* were not obtained.

REMARKS

The operation usually takes place when the youth is about 16 years of age. The time taken depends on the fortitude of the subject. The artist can finish the whole operation in three or four days. Such periods are endurance tests, of benefit neither to the subject nor to the operator.

A good deal of scabbing takes place after the operation and much of the outer skin is shed by scaling. Coconut oil and turmeric are rubbed over the skin to assist healing. Some of the youths have to lie up as they can only

walk with difficulty from the inflammation and swelling. By performing the tattooing intermittently, with rest to allow the inflammation to subside, the patient has a much easier time. The usual time to complete the full operation may be from four to six weeks. Any longer period is due to longer resting periods. In prolonged cases, the artist goes home and carries on with other work in the resting intervals.

From the point of view of modern surgery, the preparations and carrying out of the operation seem to invite danger. The cloth used for sponging and applying directly to the bleeding surface is old bark cloth that has been softened by use. It is soaked over night in any available fresh water contained in an unsterilized wooden bowl. The skin over the operation site and the instruments receive no special treatment. There seem to be few septic complications in spite of the lack of asepsis and antisepsis.

WOMEN'S TATTOOING

The tattooing of women being far less elaborate and ceremonial than that of the men is not dignified by the name of *tatau* but is termed *malu*. The *malu* is a lozenge-shaped motif placed in the middle of the poplitcal space and being the most important single motif is also used to include the whole process. There is thus no confusion in terms as the *malu* motif is confined to women.

As the patterns and full design are quite simple, the tattooing of a girl is often used as an opportunity for a student to try his prentice hand. This is also rendered possible by the fact that there is no *fusita* (fine mat) passed or any of the ceremonial that marks the tattooing of the male. It is often sufficient reward for the novice to have the opportunity of practice and to be well fed during the period occupied by the operation. When the tattooing is finished he may get a fine mat and a feast with pork. In these days, he may receive a little money. The reward depends upon the wealth and generosity of the girl's father. For the daughter of a high chief, who is to become the village taupou, it can be readily understood that an expert artist would be requisitioned and his reward greater.

TATTOOING MOTIFS

The wide bands and series of fine parallel lines (*aso laitiiti*) are not used. The design consists of the individual motifs that were used with men for enhancing between the bands and filling in the larger areas without bands. These motives are arranged in horizontal, vertical, and oblique rows.

Of the motifs used with men, the centipede, caterpillar, tern, and the bent knee are much in vogue. The full design of a woman's tattooing was obtained for me by E. Stehlin, Jr., of Savaii and the names of the motifs were given by the artist. The artist was young and confident in his knowledge. It is thus interesting to note that the names given by him are not quite reliable

and illustrate a stage in degeneration when old motifs are confused with, and replaced by, modern introductions. (See figure 337.)

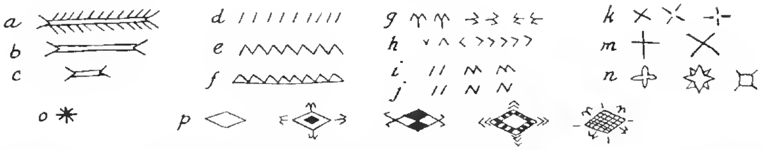


FIGURE 337.—Women's tattooing motifs. *a*, *b*, and *c*, The centipede: three forms of the centipede motifs are shown, each having the wide body formed by two parallel lines. The ends are formed by laterally directed "bent knees." In (*a*) the centipede motif is quite obvious; in *b*, the side legs are omitted; in *c*, the side legs are omitted and the body is so short that it would not be recognized as the centipede motive if the previous forms were not known. The young artist had lost the centipede idea for he termed the motives *fa'atala* (spiked) which holds for the forms (*b*) and (*c*) owing to the end oblique projections. In the men's motives *fa'atala* applies only when the "spikes" are on one side of the line. When the motifs figured are used in a row, the row is called *atu fa'atala*. *d*, and *e*, The caterpillar: the caterpillar (*anufe*) motif is extensively used. When being tattooed, the parallel limbs running in one direction are first made (*d*). When the length is completed, the opposite limbs are formed (*e*). Here again, the confident young artist having applied *fa'atala* to the centipede motif, had the centipede name of *atualoa* to spare. He therefore, applied it to the caterpillar motive and called it *atualoa* when it should have been *anufe*. *f*, Small triangles (*fa'amuli'ali'ao*). The small triangles are occasionally introduced on a line and instead of being likened to a pandanus leaf (*fa'atala laupaongo*), in women's tattooing they are likened to the apical whorls of the *Trochus niloticus* and thus called *fa'amuli'ali'ao*. With men, the term is restricted to the large triangles on the back of the thigh. *g-j*, A small group where the original tern and bent knee motif have become associated with three Roman letters, *M*, *N*, and *V*. *g*, The tern (*ngongo*). The true tern motif persists and is much used, but there is a tendency with the younger artists to cut off the tail and confuse it with the letter *M*; *h*, bent knee or pillow legs. The bent knee or pillow legs in the form of single chevrons is much used in rows. The name of *vaetuli* and *vae'ali* is being abandoned by the younger school who apply the name of the letter *V* to it. The name of the letter in Samoan is *vi* and the old motif thus gets the modern name of *fa'avi*. *i*, The letter *M* (*fa'amo*). The letter *M* as a motif is not made like the Roman capital letter with the sides vertical. The motif is formed as in making the zigzag caterpillar motif by making two oblique limbs parallel as on the left of figure (*i*) and then making the other two obliques in the opposite direction. It is thus the tern motif with the wings but without the mesial projection backwards to form the body and tail. The letter *M* is called *mo* in Samoan and the motive becomes *fa'amo*. *j*, The letter *N* (*fa'anu*) made in the same way with a pair of obliques, united by one limb in the opposite direction. The letter name is *nu* and the motif becomes *fa'anu*.

The letters *M* and *N* have not followed the exact form in the alphabet but have been made with the Samoan use of oblique lines. The influence of modern education is apparent in the contraction of the tern motif into the letter *M* and this has been followed by the addition of the letter *N* as a motif. The alphabetical association of ideas has converted the single chevron into the letter *V* and its old names are being forgotten. If tattooing survives long enough, it will be interesting to note whether the tern motif will disappear altogether and the outer limbs of the letters *M* and *N* become vertical. By that time, the motifs will have become thoroughly rationalized as originating altogether from the introduced alphabet.

Besides the innovations from the alphabet, some other motifs are used which are best described under their native names. *k*, The *aveau* (star fish). Two lines obliquely crossed or four shorter lines radiating obliquely to get the same effect and even radiating at right angles, give three forms of a motif that is likened to a star fish. It is called

fa'aaveau, or simply *aveau. m,* The *toluse.* Two longer crossed lines forming an upright cross have been figured by Marquardt (20, Taf. X, 1) and another form as an oblique cross (20, Taf. XXII, 1). To these he gave the name of *toluse. n, Fa'afetu* (like a star). The actual star motif seems to be of more recent development. Marquardt (20, Taf. VIII, 5) gives it with four limbs while Stehlin's informant gave it with four additional points added. This latter form obviously belongs to the same period as the letters of the alphabet. Another form shaped in a square with oblique lines from the angles is an innovation termed also *fa'afetu. o, 'Alu'alu* (jelly-fish). Four crossed lines making eight points, figure frequently in the examples of women's tattooing figured by Marquardt, and the name of *'alu'alu* refers to the fringing tentacles of the jelly fish. This motif occupied the site in the older designs now occupied by the more recently elaborated stars. The *'alu'alu* motive is quite simple and if old, it forms another example of where an old original motif is being displaced by the more recently introduced star form. *p, Malu.* The basis of the *malu* is a lozenge with the long diameter lying horizontally. A number of forms are shown. It may be plain or enhanced internally in a variety of ways including cross hatching or *fa'a'upenga.* The tern, bent knee, and other motifs to the outer side do not belong strictly to the *malu* motive itself, but the *malu* forms a centre from which lines of other smaller motifs radiate.

THE OPERATION

Only two instruments are used; the narrowest *au fa'atala,* and one of the medium *au songi* for making lines. The very wide *au tapulu* is never used.

The first motif tattooed is the lozenge-shaped *malu* at the back of the knee. The patient lies first on her face to expose the back of the leg and then on her back to expose the external surface of the thigh. (See figure 338.)

The anterior, internal, and external vertical rows having been formed with diagonals between them, the patient is turned over on her face again and the back surfaces of the thigh and knee (*alo-i-vae*) are dealt with. The *fusi* upper belt is the last part tattooed.

The artist may vary the general routine order to suit himself.

The hands. Both men and women tattoo the hands. A band of some motif is run round the wrist and forms the *fusi* (belt). On the dorsum of the hands and the fingers, dots, stars, tern, bent knees, and other motifs may be distributed at the artist's taste.

Scarring. Scars were burnt on the arms or chest to form ornamentation. A lighted dry coconut midrib or a piece of lighted bark cloth were used. The scars were also made as a sign of mourning. Young children often do it out of bravado to show how they can stand pain.

TRADITIONAL ORIGIN

The tattooing artists formed an influential guild in their day. The patron deities of the craft were Taema and Tilafainga. In the myth recorded by Fraser (12, p. 179) it is stated that Taema and Tilafainga were the Siamese twins from Manua who went from Tutuila to Fiji. There they became friends with two tattooing artists named Tufou and Filelei from whom they obtained

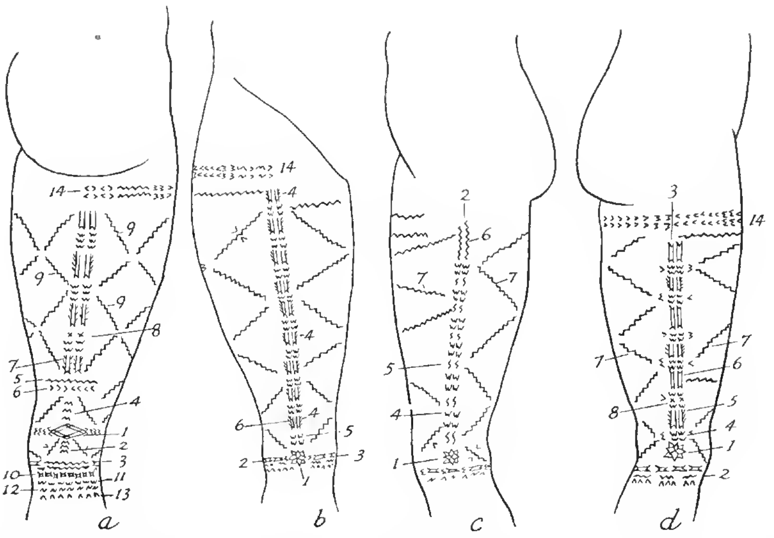


FIGURE 338.—Women's tattooing designs (thigh): *a*, back of right leg. The *malu* (1) is tattooed in the middle vertical line of the popliteal space about 1.125 inches above the line of the knee joint. Below the *malu*, three tern or letters *M* are made in vertical line (2). Below the actual joint line two transverse caterpillar lines (3) are made. Towards the outer surface, the caterpillar motive is replaced by a short centipede motive without side legs. These are continued in a single transverse band around the knee joint to form the knee belt or *fusi tuli*. Below the single row of short centipedes, there is a row of short caterpillar motives, with a row of bent knees below that again. The three rows are included in the knee belt. As the belt passes around to the front, the patient is turned over. *b*, Front of right leg. In the middle line of the anterior surface, a star (1) is tattooed over the ligament by which the patella is attached to the tibia. The star is in the direct line of the knee belt. The belt (2) is tattooed as far as the median star and then carried on around the inner surface (3) until it meets the two caterpillar lines on the back of the joint (*a*, 3). From above the anterior star, a vertical line called *atu fa'atala* is carried up in the middle line (4). The line is composed of two vertical pairs of tern or M (5) followed by two short centipedes (6) with legs and the order repeated to the end. *c*, Inner side, right leg. In the middle line of the inner surface of the leg, a star (1) is tattooed just above the belt and so resting right over the knee joint interval between the femur and the tibia. From the internal star, another line is erected vertically in the middle line (2) consisting of two vertical rows of pairs of terns or the letter *M* (4) and *N* (5). At the upper end, the letter *N* gives way to caterpillars (6). The young artist called the centipede motives *fa'atala* and though there are none in the inner vertical line, the line was still called an *atu fa'atala*. Between the internal and anterior vertical lines some diagonal caterpillar lines (7) are tattooed to break up the surface. *d*, Outer side, right leg. In the middle of the external surface a large star (1) is tattooed just above the knee belt (2). From this another *atu fa'atala* (3) extends vertically upwards. The motives again consist, like those of the anterior vertical line, of two pair of tern or the letter *M* (4) and the longer centipede motive which may have legs (5) or be without them (6). Diagonal connecting caterpillars (7) are then extended to meet similar lines from the anterior vertical line. The *aveau* motive (8) is introduced into the vertical row. Returning to (*a*, posterior surface.) Above the *malu* motive (1), three vertically placed tern (4) are made. Above these two transverse lines are formed, the upper being the zigzag caterpillar (5) and the lower the bent knees (6). Here again

the young artist called the zigzag motive, *atualoa* instead of *anufe* and hence referred to the transverse lines as a landmark called *fa'aatualoa-o-le-alo-i-vae*. *Fa'aganufe* would be more correct. From above this in the middle line rises the vertical arrangement of the letters *M* and the paired centipedes (7). The oblique cross (8) forms the *aveau* (sea-star) motive. On either side of the posterior vertical line now called the *atutala-o-le-alo-i-vae*, oblique caterpillar patterns (9) are formed to meet similar lines from the internal and external lines.

The *tali malu* unit is next dealt with by making transverse lines of different motives below the knee belt on the posterior surface. Thus the first line consists of the variant star motive (10). Then follows the letter *M* (11), the letter *N* (12) and finally a row of bent knees (13). The number of lines made in the *tali malu* depends on the length of the girl's limbs. Short girls got fewer lines as it was not the fashion to come too far down on the calf.

The *fusi* upper belt (14) is the last part tattooed. It consists of two transverse rows of various motives, such as the bent knee, *M*, *N*, and caterpillar. It runs from the upper end of the anterior vertical lines in (*b*) outwards above the end of the external vertical line in (*d*), and continuing inwards on the posterior surface ends above the posterior vertical line in (*a*). The belt is marked 14 in figures *a*, *b*, and *d*.

tattooing instruments as well, evidently, as a knowledge of the craft. The names of Tufou and Filelei are remembered in the songs sung during the tattooing operation. These women returned to Falealupo in Savaii where Tilafainga became the war goddess Nafanua. Taema swam back to Tutuila where she settled down at Poloa and followed the occupation of tattooing. In the land of Tufou and Filelei, it was the custom to tattoo the women and not the men. Taema kept repeating this during her swim, but ended up by getting the order reversed. Hence her song on arrival at Tutuila was:

Tupu le tane, ta le tatau.	When a male grows up, tattoo him.
Tupu fafine, fanafanau.	When a woman grows up, let her bear children.

CUSTOMS

Even now it is customary for a number of youths to be tattooed at the same time. The parents share the expenses of employing the artist. In olden times, according to Stair (33, p. 158), it was customary for the sons of the various *tulafale* (talking chiefs) to be tattooed at the same time as the chief's son so as to share his pain (*tale-i-lona-tinga*). The chief's family bore the expense of feeding and paying the operators and in addition made presents to the boys who had shared the pain. It is said that the tattooing of "the sharers of pain" was often carelessly done and was looked down upon as *'O le ta tulafale* (talking chief's tattooing). Be this as it may, we have here further evidence of the astuteness of the talking chiefs. They, as the councillors, were responsible for custom and ceremonial to a large extent. Hence, in the custom of sharing the pain, the talking chief got his son tattooed free of cost and was paid with a fine mat as well. It is probably this less decorative form of tattooing that led to the distinction originally between the tattooing of a high chief and that of a talking chief as mentioned by Handy (14, p. 21).

When a number were tattooed, a large shed was often built specially in a village open space to form an operating theatre. Sham fights and various games were played during the gatherings. In present times, young friends gather around with modern musical instruments and may be seen in the operating house endeavoring to cheer up the patient with melodies that have been diffused from foreign music halls.

The artists as belonging to a skilled guild were formerly highly paid in fine mats and bark cloth. The payment took place after the completion of the operations. Following the payment of the artists, the families of the boys who shared the pain received their recompense.

Stair (33, pp. 163, 164) draws attention to the very important ceremony of sprinkling the tattooed (*Lulu'unga-o-le-tatau*). The night before, the artists and their assistants with lighted torches went through a number of motions until the torches were all put out at a given signal. A coconut water bottle was dashed to pieces in front of the newly tattooed youths, the torches relighted and a search made for the plug. The finding of the plug was important as its loss denoted death to one of the tattooed party.

The next day all the newly tattooed were sprinkled with water from a coconut by one of the operators. The sprinkling (*lulu'u*) ceremony had to be done over each person tattooed irrespective of rank but the breaking of the coconut water bottle was done only for a high chief.

In olden days custom, personal status, and the approbation of men and women were the incentives to undergoing the operation. In modern times, approbation is still sought. The fear of pain is overcome by the keen desire to bear the marks of manhood and to be able to hitch the kilts a little higher at the evening dances and so demonstrate superiority over the untattooed. As maturity follows and the young man succeeds to the position of *mataï* (chief), he has the satisfaction of feeling that he is truly one of the elect for he can bare his knees with assurance as he sits cross legged before his wall post in the circle of the titled.

CONCLUSION

A comparative study of Polynesian material culture, though tempting as each group of islands is investigated, cannot be dealt with comprehensively until the field survey of the whole Polynesian area has been completed. Polynesian culture has been affected by the neighboring cultures of Micronesia and Melanesia and the more distant cultures of Indonesia with also perhaps some influence from New Guinea. Until field work from all these areas is available, the comparative ethnologist can but make interim reports which may do good by arousing opposition and thus stimulating inquiry.

Linton (19, pp. 447-467) acting on Bacon's dictum that truth can be brought out of error much more readily than out of chaos, made a preliminary

comparative study of six Polynesian territories; Marquesas, New Zealand, Hawaii, Society Islands, Samoa, and Tonga. He found that Samoa and Tonga showed a closer cultural agreement than any other two Polynesian localities. The Marquesas and New Zealand showed an almost equally close agreement while Hawaiian culture resembled them on the material side. If the points of difference between the Marquesas, Hawaii, and New Zealand are carefully analyzed and local development excepted from the traits compared, it will probably be found that the differences between the three localities are less than is indicated by Linton's tables. As a case in point, the house entrance on the side is listed for the Marquesas and Hawaii while New Zealand is made to differ with the house entrance at the end. A well known type of Maori house exists, however, with the entrance at the side. It is this type that should be compared with the Polynesian house and not the specialized type listed by Linton.

The fly flap. It is difficult to dispose of culture traits fairly in the brief space allocated to them by parallel columns. The listing of the fly flap (19, p. 454) illustrates this. The fly flap is given as present in Hawaii, Society Islands, Samoa, and Tonga and absent in the Marquesas and New Zealand. The natural inference is that Hawaii shares a culture trait with Samoa that is absent from the more allied cultures of the Marquesas and New Zealand. Analysis of the trait shows that the Samoan article is a whisk of braided coconut fiber while the Hawaiian article is made of feathers. The Hawaiian feather whisk is part of a high chief's regalia and is associated with the feather cloak and feather helmet which form a distinct local development. The Samoan fiber whisk is in common use by all chiefs but the talking chiefs made their whisks larger to distinguish their particular office. Between the Hawaiian and the Samoan whisks there is not the slightest affinity in technique. The connection is evidently the question of dealing with flies. But New Zealand, which is given a blank in Linton's table, also had a definite fly flap used to protect a corpse lying in state. In this flap, a narrow strip of leaf material was wound by wrapped work around four arms formed by tying a short crossbar to a handle and thus providing a lozenge-shaped surface. The three widely separated localities have each a fly flap produced by three totally different techniques. It may be suggested, however, that the Hawaiian and Samoan fly flaps are associated with chieftainship and thus show a trait in common that is absent from the New Zealand fly flap. Here again, it requires little thought to realize that in New Zealand it was the bodies of chiefs that were allowed to lie in state long enough to create the need for the fly flap. Thus various arguments can be adduced to show similarities between culture traits that are widely different as regards their origin and technique. A totally different technique indicates a new invention whether it was developed locally or entered a locality by diffusion. Hawaii and the Marquesas are really closer

together because neither used the utilitarian Samoan whisk made out of coconut fiber. New Zealand may be omitted from the comparison because she had neither the coconut palm nor the need for whisks to keep flies away from the living.

Bowling. It is difficult for an authority on one Polynesian locality to cover the whole area by means of brief comparative tables and avoid error. One difficulty is the question of what elements in the cultures of the various localities are truly comparable. If the question of origins is being studied, it seems an error to compare the plank canoe of one locality with the five-piece canoe of another when the two forms exist in each locality. Another difficulty is the question of exact data. Valuable data may not be available in print even of localities concerning which the information has up to now been considered as sufficient. This is true with Samoa as shown by the listing of *bowling* in Linton's tables (19, p. 453). For the six localities, bowling is given as *important* in Hawaii and *not used* in the other five. The natural deduction is that bowling a flat stone disc with an underhand throw is a local development in Hawaii. The disc under the name of *te'a* has been shown in this work to be present in Samoa in the form of a slice of green breadfruit or a disc of selected coral rock. It was thrown with or without a strip of hibiscus bark. Though Linton gives the game as absent in the Society Islands, it is well known under the name of *pua* in some of the islands of the neighboring Cook Group. A slice of breadfruit is used by children and a heavy well-made disc of ironwood is used by adults with a throwing strip of hibiscus bark. Though the Samoans throw with a jerk from behind the back, and the Cook Islanders use a forward throw, both throw for distance. In both Samoa and the Cook Islands, the evident origin of the disc from a slice of breadfruit is indicated by the use of the breadfruit disc as a makeshift, while in Hawaii it is significant that the name of *ulu maika* is applied to the polished stone disc when *ulu* is the Hawaiian name for breadfruit. New Zealand also cannot be dismissed from the comparison. Stone discs, for which no use can be assigned by the present population, have been found near a level sea beach which would form an excellent throwing ground. These discs, while forming an unsolved problem in relation to the culture traits of New Zealand itself, when considered in relation to the use of discs in other Polynesian localities, lead one to the opinion that like them they were used in a game of bowling for distance. Bowling has thus a wide distribution with Samoa, Cook Islands, Hawaii, and probably New Zealand. It was most probably present also in Tonga owing to its close cultural affinity with Samoa. Bowling, instead of being present only in Hawaii, is thus absent only in the Marquesas. Instead of bowling being a local development in Hawaii, it was a trait in a culture that extended from west to east and reached the northern and southern limits of the east marginal area.

Throwing cord. The distribution of the throwing cord in Polynesia must also be revised in the light of more recent information. Linton's table (19, p. 452) confines the distribution to New Zealand and the Marquesas. The throwing cord is used in two ways; with the simple cord, or with the cord attached to a handle. In the Marquesas, the simple cord without a handle was described by Linton (19, p. 387). In New Zealand, the handle was used. The New Zealand method consisted of sticking one end of the dart in the ground in a slanting position. The knotted end of the cord was laid against the side of the dart towards its lower end, the cord took a turn around the dart and passed over itself on the inner side of the knot as in the simple form of throwing. The cord was held taut by the handle along the oblique course of the dart. A quick jerk with the handle propelled the dart forward and the cord was automatically released. Since the publication of Linton's work, I have described the throwing cord in the Cook Islands where both the simple form and the cord with a handle are used (39, pp. 337, 338). The Cook Islands method of using the handle differs from New Zealand in that after fixing the knot in the usual way, the cord is wound in a wide spiral round the dart which is then laid flat on the ground. A sharp jerk with the handle propels the dart. In this work, both the simple and the handle method are recorded for Samoa. The handle method is exactly the same as the Cook Islands method. Mr. Gerrit P. Wilder informed me that he was taught a method of dart throwing in Hawaii by a Hawaiian boy. A short cord with a knot at one end and the other end tied to a short handle, was fixed to the dart by the turn over the knot. Some wide spiral turns were taken round the dart with the cord, the dart was laid on the ground with the forward end slightly raised by placing a stick transversely under it and the dart then propelled by a forward jerk of the handle. This is exactly the same as the Cook Islands method. The simple method is thus recorded for the Marquesas, Cook Islands, and Samoa, while the handle method existed in Hawaii, Cook Islands, Samoa, and New Zealand. The New Zealand method is an advance on the Cook Islands method and can be quite adequately accounted for as being derived from a trait generally distributed through Polynesia. Linton lists the throwing cord among the cultural traits that he attributes to a negroid stratum (19, p. 463) in the Polynesian population. The supposed closer contact of the Marquesan and the Maori to the hypothetical negroid stratum cannot be supported by the more accurate distribution of the throwing cord given above.

CULTURE AND RACE

The task of separating what is known of Polynesian material culture into distinct Negroid, Caucasian, and Indonesian divisions, as attempted by Linton (19, p. 463) may be left as he left it. If more detailed information from a part of the Cook Islands and Samoa can so alter the distribution relied upon

by Linton, there is no knowing what will happen when the work of Bishop Museum expeditions on the material culture of the Austral Islands, Society Islands, and Tonga are published, to say nothing of the further work planned on the Tuamotus, Cook and northern islands. The further task of associating the uncertain culture traits with definite waves of distinct racial stocks which are based on incomplete anthropometrical data is one which must await collaboration between the ethnologist and the physical anthropologist when each has more information than is available at the present time.

Territorial relationship of culture. Linton (19, p. 460) gives Society Islands culture as occupying an intermediate position with numerous resemblances to both the Samoan-Tongan and Maori-Marquesan cultures. On the material culture side, the outstanding resemblances between Samoa and the Society Islands as listed by Linton are oval houses and the construction of canoes made of several courses of planks cut to fit together accurately. When these two important traits are analyzed as regards technique, they will be found to have nothing in common beyond the general statement of the traits. Society Islands culture will be found to be closer to Maori, Marquesan, and Hawaiian cultures than it is to Samoan.

Territorial designations. Samoa has been referred to in various writings as central and in others as nuclear Polynesia. It is more accurate to regard it as forming a locality in western Polynesia and providing a type culture of the western Polynesian area. The Society Islands both geographically and historically form the true center of the largest groups of islands and the largest numerical groups of people. Hawaii, Marquesas, Tuamotu, Easter Island, Austral Islands, Cook Islands, and New Zealand are all marginal to the Society Islands. For the purposes of the present study, the whole marginal area with the Society Islands as its center will be regarded as forming the eastern Polynesian area with variant forms of an eastern Polynesian culture. The object will be to compare and contrast some of the main features of Samoan material culture with the culture of eastern Polynesia.

HOUSES

End posts. The rectangular house with the ridgepole supported by end posts is regarded as characteristic of eastern Polynesia. This trait is omitted for Samoa in Linton's list (p. 449). Attention has been drawn to the *to sunu'i* type of Samoan house which shows that the ridgepole supported by end posts was also an old type of Samoan construction.

Rounded ends. The rounded ends or apses, now characteristic of Samoan houses, have been shown to have been obtained in the simple form by parallel principal rafters laid between the end rafters of the middle section and a curved wall plate. In the Cook and Society islands, the rounded end was

obtained by end rafters radiating like a fan between a short crossbar below the end of the main ridgepole and the curved wall plate. In the more specialized Samoan apses, the principal end rafters were discarded entirely and the thatch rafters were supported by curved purlins. The curved arches so formed were erected parallel to the middle arch which bisected the rounded end transversely. In the poorer houses, the arched purlins were formed of long single split poles; in the better houses, they were formed of short rounded sections fitted together with special joints carrying interlocking projections (*lave*). In the better houses of the Society Islands, the rounded ends retain the radiating principal rafters, and if purlins are used, they are horizontal with the curb plate. The parallel oblique arches with the *lave* locking joint are unknown. The Samoan apse is curved longitudinally as well as transversely by arranging the heights of the transverse arches. The Society Islands apse is curved transversely but owing to the use of straight, stiff, radiating principal rafters, there is no longitudinal curve. Technically there is not the slightest affinity between the Samoan and Society Island apses.

Rounded houses. The round house has been listed for the South Island of New Zealand but no technical details are available. The neighboring Chatham Islands, the material culture of which according to Skinner (31, p. 133) has affinity with the South Island culture, has had a round house described in which the rafters evidently radiated from a central post. This type of architecture is unknown in Samoa. There is no true round house in Samoa for the guest house, usually designated as such, is an approximation of the round ends of a long house by shortening the middle rectangular section.

Roof framework. The roof of the middle section of Samoan houses is curved by using thin flexible rafters of coconut wood. The horizontal purlins are on the inside of the rafters. As the rafters are hung from the ridgepole and the purlins braced apart by collar beams, the wall plate plays a minor part and the wall posts are put in last. In the Society Islands roof, the wall plate is important and must be fixed to the top of the wall posts before the straight stiff rafters can be stretched between the ridgepole and the wall plate. The purlins are then added on the outside of the principal rafters. The slope of the roof is straight.

Furniture. The wooden seats with four legs cut out of the solid which are characteristic of the Society and Cook groups are absent in Samoa. In Samoa, the bamboo pillow supported on inverted v-shaped legs is in common use.

The rectangular house with the ridgepole supported by end posts, with straight, rigid principal rafters supported by the ridgepole and a wall plate, with wall posts that have to be put in to support the wall plate before the

rafters can be added, and with the purlins resting on the outside of the rafters, is characteristic of eastern Polynesian culture. This framework technique was known in Samoa and is still used in the less pretentious middle sections of the poorer houses. In the better class Samoan houses, the simpler technique gave way to the curved roof with rounded ends which tradition attributes to an introduced technique developed by a special guild of builders.

In eastern Polynesian culture, the rectangular framework retained the technique of the original form. The technique of the rounded ends is so entirely different in form and details that it cannot possibly be regarded as a diffusion from Samoa. The alleged similarity between Samoa and the Society Islands in this culture trait does not exist in fact. The similarity between Samoa and South Island of New Zealand as regards round houses cannot be argued without technical detail but if the structural principle of the Chatham Islands round house applies, there can be no affinity.

FOOD

In Samoa, little use is made of pounding cooked food with the result that no food pounders of a permanent type, either in wood or stone, were made. The adz-shaped breadfruit splitter is characteristic. In the east, each locality is characterized by stone food pounders well made and typically shaped. The breadfruit splitters are wedge-shaped without the Samoan type of handle. While the Samoan tripod tree trunk type of coconut grater frame was seen in Tahiti, the four-legged stool with a projecting arm is the usual eastern type. Wooden bowls are of great variety in shape but it may be said that the round Samoan kava bowl with legs is not made in the eastern area.

PLAITING

In Samoa, the wall screens and better food platters, both plaited in twill, are characteristic. The wall screens occasionally used in the Cook Islands are made with a check stroke in the same way as the Samoan carrying sheets. The Samoan method of plaiting the coconut half sheet by leaving the first leaflet odd and plaiting the subsequent leaflets in crossing pairs is a local detail. The rough basket made with a single strip of half coconut leaf is the common type in Samoa, whereas the common basket to the east is made of a full leaf section in which the leaflets of both sides are first plaited and the bottom closed before the leaf midrib is split to form the basket rim. The single strip half leaf basket is also made in the east but the join with the last leaflet twisted over the rim seems to be local to Samoa. In the various forms of twilled baskets, the methods of twisting the leaflets at the rim and the combinations of stroke are similar in both areas.

The Samoan floor mats are coarse as compared with eastern mats. In the Cook Islands, the sleeping mats reach a high development as regards colored

borders, while in Hawaii the *makaloa* mats reach the highest development in fine work. In Samoa, fine plaiting was directed towards mats used as clothing on state occasions.

CLOTHING

Kilts. The ti leaf kilt with a three-ply braided waist cord was common to both areas as the usual garment for rough wear. Kilts made of strips of bast for use in dances are also common to both areas as are also the methods of attaching the bast strips to a single or a double suspensory cord. In the further development of such garments, however, Samoa confined itself to a plaiting technique in check or twill with an ornamental finish in three-ply braid tails in the *'ie tutu pupu'u* textile kilts. There is no trace of the single-pair twine being used in garments though the technique was much used in fish traps. In eastern Polynesia, the single-pair twine is found in the bast kilts of the Cook Islands and several spaced rows were used in the garment technique of the Society Islands, Tuamotus and Rapa. In New Zealand, the single-pair twine (38, p. 71) formed the foundation from which the extensive and varied downward weaving technique of that locality was developed.

Tagged garments. The Samoan shaggy garments made with a check plait and completely covered with tags of fibre are characteristic of Samoan culture. The New Zealand rain capes and cloaks also completely covered with fibrous tags have a superficial resemblance to the Samoan garments but they are made with a spaced single-pair twine or a two-pair interlocking weft and have no affinity with them either in general technique or the method of attaching the tags.

Fine mats. The Samoan fine mats used as ceremonial skirts and a unit of value, mark a high development in fine check plaiting. Though no such mats were evidently made in eastern Polynesia, the Hawaiians were capable of even finer plaiting than the Samoans. A very fine Samoan mat may have as many as 22 wefts to the inch but a Hawaiian plaited *malo* girdle in Bishop Museum contains no less than 31 wefts to the inch. Samoan technique shows an advance in the splitting of the pandanus leaf into two layers to provide the thin anterior layer as plaiting material. As a regular technique this does not seem to have been present in the east though the Cook Islanders split off the anterior layer to provide the material for the dyed wefts used in the overlaid plaiting of the decorative borders of their sleeping mats.

Featherwork. Samoan featherwork though not extensive was important as the valuable fine mats were not complete without it. The feathers were not woven into the edges of the fine mats as Linton states (19, p. 454). They were caught in the knots of a fine thread as already shown and the thread bearing the feathers was sewn along the edge of the mat by another thread.

The feather kilts and one form of addition to the *tuinga* headdress consisted of strings of feathers knotted in the same way. The technique of knotting feathers to a thread was described by Ling Roth (38, p. 144) in some warps of an old Maori cloak but it seems to have been an abnormal instance. The technique of feather work in eastern Polynesia consists of no less than three methods, all of which are listed by Linton. In Hawaii and the Society Islands, the feathers were tied by a separate thread to the meshes of the network which formed the basis of the cloak or girdle. In the Marquesas, the feathers were pasted to the material they had to decorate. In New Zealand, the feathers were fixed to the warps by the weft elements as the weaving of the garment proceeded. There is nothing common in the technique of the four methods of the Polynesian area enumerated but each method of feather fixation has been influenced by the form of the base they had to decorate. There is yet another form of feather fixation seen in feather frontlets in which the feathers are included in a plaited braid but there is no affinity to Samoan work.

Bark cloth. The paper mulberry and the manufacture of bark cloth are found throughout Polynesia. Different methods depending on the presence or absence of felting occur between the eastern and western areas. In eastern Polynesia, the paper mulberry bast is soaked in water for some time, allowed to drain and then beaten out in one continuous sheet to the required thickness. The bast strips are joined by the felting together of the bast fibres. Round beaters may be used in the preliminary stages of beating but the cloth is finished off invariably with four-sided beaters with parallel sides and parallel grooves set close together. The close grooves may impart a watermark to the cloth but in the Society Islands and Hawaii, special watermarks are carved on the finishing beaters. The watermarked beaters reach their highest development in Hawaii. The finished cloth is decorated by immersion in a dye, free-hand painting or stamping with leaves, flowers, special frames, or stamps cut out of wood. In stamping, the stamping object must be dipped in the dye and then applied directly to the cloth. In Samoa, the bast is not soaked for long in the water but is scraped soon with a variety of shells to remove as much of the mucilaginous material as possible. It is thus so dry that when several strips are beaten together, the material from each strip of bast comes out as a separate thin strip of cloth and is not felted to the material of other strips. The Samoan beaters are shorter and wider than those of the east, the side edges are not parallel but are splayed outwards towards the distal ends and the grooves are much wider apart and like the side edges are not parallel. There are thus neither fine grooves nor special watermarks on the Samoan implements as the technique employed does not use felting. Round beaters are also used. The single thin strips of cloth are joined together by pasting

not only to produce area but also thickness. The completed cloth may be dyed by immersion or painted freehand but stamping is not used. The method of rubbing each sheet with a dye after it is placed on an *upeti* tablet frame has been described in detail and constitutes another important difference between the methods of east and west Polynesia.

Types of beater. From the difference of the two methods of beating the bast, the marked difference in the types of beater from the two areas can be readily understood. The Samoan method did not require the close parallel grooves as a finishing stage in a felting process and consequently they were not cut on the beaters as they were unnecessary. The paper mulberry was carried to New Zealand by the ancestors of the Maori but the manufacture of bark cloth was abandoned as a clothing technique. Two bark cloth beaters (38, p. 10) dredged up from under some feet of silt and gravel in Whangarei Harbor were carved with close parallel grooves and thus link the technique of the abandoned culture trait with the method of manufacture used in eastern Polynesia.

STONEWORK

Stone structures. In Samoa, the marked feature in stonework is the absence of stone religious structures corresponding to the marae of the east central area and the heiau of Hawaii. The lack of remains of such structures may indicate that the marae type of religious structure came east by a more northerly route that missed Samoa, west from America, or was locally developed in the east central area. The absence of cut stone in Samoa is listed by Linton but he makes an exception of the stone posts of the stone house known as Le Fale-o-le-Fee. Attention has already been drawn to the fact that the stone wall posts consist of natural basaltic prisms that the hand of man took no share in shaping. Connected with the negative condition in Samoa is the absence of stone figures of human form, which are a feature of eastern Polynesia.

Stone adzes. The lack of applied effort in working stone is reflected in the technique of the Samoan adzes. The commonest types are the least carefully worked in the Polynesian area. The chipping is coarse and there are no evident signs of bruising or pecking in the finished adzes. Grinding in the common types is reduced to a practical minimum. Though Hawaiian adzes also show the minimum of grinding as compared with other eastern localities, the chipping technique is perfect as shown by the control of the marked longitudinal curve so characteristic of that locality and the fine regular chipping is in marked contrast to the coarse and somewhat irregular work characteristic of the common Samoan types. Linton's statement (19, p. 451) that complete grinding is unknown in Samoa cannot, however, be upheld as many

of the smaller adzes and the larger adzes of Types III, IV, and V are completely ground on all surfaces except the upper surface of the poll.

In cross section, the commonest forms of Samoan adz are quadrangular and not triangular as Linton shows in his list. The usual Samoan technique is therefore comparable with the marginal localities of Hawaii, Marquesas, and New Zealand and not with the central Society Islands where the common type is triangular. Of the marginal localities mentioned, Linton states (19, p. 322) that in the Marquesan quadrangular simple tanged adzes "The width of the inner (posterior) surface is equal to or less than that of the outer (anterior) surface, never greater." In New Zealand quadrangular adzes, the posterior surface is usually less in width than the anterior surface. The Hawaiian adzes are more nearly rectangular as a rule yet a number examined for this feature showed that the posterior surface was less in width than the anterior. There is thus an agreement in the cross section of the quadrangular adzes of the three eastern marginal localities. In the Samoan quadrangular adzes, the marked feature is that the posterior surface is always wider than the anterior except in the rarer form described as Type IV, subtype *A*. Of the triangular forms, only one specimen was obtained of the reversed triangular form with the wide surface in front that constitutes the common Society Islands type. This adz though well finished by being ground on all surfaces had no trace of the tang which is a characteristic feature of the Society Islands triangular adz.

Another point of marked difference is afforded by the development of the tang. In eastern culture, both central and marginal as listed by Linton (19, p. 451), the specially shaped butt or tanged adz is the dominant form. In Samoa, the tanged adz does not exist. Though Linton lists the tanged adz as "rare" in Samoa, I regard any resemblance to a tang in Samoan adzes as being due to accidental and not purposive technique.

CANOES

For comparative purposes, canoes must be dealt with in two distinct divisions; the dugout and the plank canoe. The simple dugout consists of a hollowed-out section of tree trunk. In some islands, where trees of sufficient length of straight trunk were or had become scarce, the dugout hull may be formed of two or more sections joined together transversely. In New Zealand, on the other hand, large war canoes were formed of three pieces to get an upward curve at the ends. The small dugout is for use within the sheltered waters of the lagoon. It may be deepened by building up the sides with plank gunwales. The addition of a gunwale on either side forms a three-piece canoe which is in common use both east and west. For use outside the lagoon, the dugout hull was made larger and was built up with deeper gunwales. To prevent waves washing in over the bow or stern, bow and stern pieces were

added. The bow piece took the form of a long cover or was made shorter with a transverse vertical breakwater. This constituted the five-piece canoe that Linton (19, p. 450) showed as characteristic of the eastern marginal cultures. It is a higher development of the dugout canoe made for use in the open sea. The plank canoe was made of tiers of short planks built up from a mesial piece which served as a keel but was not a dugout. The plank canoes were carvel-built with the edges of the planks accurately fitted together and lashed edge to edge. Both the five-piece canoe and the plank canoe were used in the eastern and western areas. It is in the principles of technique and the divergences from the common forms that the real difference lies between east and west.

Technique. An outstanding difference in technique lies in the method by which the separate gunwales and planks were joined together. The most widely spread and evidently the oldest method consisted of boring holes right through the wood from side to side in opposite pairs near the edges. The lashing thus showed on both the inside and the outside of the canoe. After lashing one pair of holes, it was usual to carry the braid along the inside of the canoe to the next pair of holes and thus form a continuous lashing. The other main method of boring holes through projecting flanges formed on the inner side of the plank edges has been described in full in this work. After lashing each pair of holes, the braid is fixed and cut off. The lashing is thus interrupted and shows on the inner side only of the canoe. An intermediate form of lashing consists of boring oblique holes from the same surfaces of two planks so as to meet on the edge surfaces that are fitted together. In this method the planks must be fairly thick but there are no projecting flanges. The lashings show on one side only. The three forms of lashing may be referred to as the right-through, the flange, and the oblique methods.

Simple dugout. The simple dugout while common throughout Polynesia is characterized in Samoa by a deep vertical or even concave cutwater at the bow with a sharp projection forward at the upper end. The usual dugout in the eastern area is marked by a long gradual slope upwards to a pointed bow. In some islands, however, the sharp cutwater is seen but it is not so deep usually as the Samoan. On the other hand, the gradually sloped bow is present in the smaller left canoe of the double *'alia* of Samoa. The transverse join of the dugout hull is not seen in Samoa while it is common in the east.

Five-piece canoe. The five-piece canoe was present in Samoa in the *'iato lima* type while the five-piece bonito canoe with a dugout hull is supplanting the plank bonito canoe in some parts of the group. The bow and stern covers are flat or conform to the slight upward curve of the ends. There is no break-water, forward bow or upward stern projections. Ornamentation takes the

form of mesial rows of white *pule* shells attached to knobs on the upper surfaces of the bow and stern covers. The forward and upward projections at bow and stern for ornamentation that were present in the *taumualua* type of canoe alone were an innovation to that type which was first built by an American in 1849. The gunwales in the bonito canoe are attached by the flange method of lashing and the covers by a combination of the flange and right-through methods. The eastern five-piece canoe is characterized by the right-through method of lashing. As Linton pointed out, the forward bow and upward stern projections were present in the Society Islands, New Zealand, and the Marquesas. They form an ornamental addition to a simpler original form. The addition of a breakwater to the bow piece or cover were present in New Zealand and the Marquesas and are to be seen on the small sea fishing canoes of Tahiti at the present time.

Plank canoe. The plank canoe in Samoa is characterized by the flange join with interrupted lashings. The gunwales may have an alternating series of oblique lashings with the lashings showing on the outside. The eastern plank canoe, is characterized by right-through lashings of the continuous type though they may be interrupted here and there. This feature was observed in a plank sailing canoe from Raiatea seen in Tahiti and in a Tuamotu plank canoe in Bishop Museum. That the old voyaging canoes were lashed with the same technique is shown by the following quotation from Teuira Henry (15, pp. 549, 550) regarding the building of the famous Hohoio canoe of Hiro:

Holes were bored into the keel and planks at even distances apart, and the men set to work in the following order: Hatu, the chief of Hiro's artisans, worked on the outer side to the right of the canoe, and Tau-mariari, his assistant, worked on the inner side; Memeru, the royal artisan of Opoa, worked on the outer side to the left of the canoe, and his assistant, Ma'i-hae, worked on the inner side. Each couple faced each other, fixing the planks in their places and drawing the sennit in and out in lacing the wood together; and the canoe soon began to assume form, the bows facing the sea. To make the work light, they sang.

TE PEHE O HIRO	(THE SONG OF HIRO.)
E aha ta'u, e Tane e,	What have I, O Tane,
Tane, atua no te purotu e?	O Tane, god of beauty?
E 'aha.	'Tis sennit.
E 'aha o te hui o te ra'i,	'Tis sennit of the host of heaven,
E 'aha na'u e Tane e!	'Tis sennit for thee, O Tane!
E tui i roto, e puputa i vaho,	Thread it from the inside, it comes outside,
E tui i vaho, e puputa i roto.	Thread it from the outside, it goes inside.
Nati hua, nati mau.	Tie it fully, tie it fast.

Hiro, a noted explorer and ancestor of eastern Polynesia, was a contemporary of the Rarotongan ancestor, Tangiia, and lived four generations before the colonizing fleet set out from the Society Islands to New Zealand in approximately 1350 A. D. Thus neither the old nor the recent plank canoes of

the Society Islands have any affinity in lashing technique with the plank canoe of Samoa.

Seam battens. The right-through method of lashing in repairing split planks has been described for Samoa. In New Zealand and the Marquesas, the right-through lashing of the gunwales was supplemented by placing battens over the seam before the lashings were made. This specialized technique has also been observed in Samoa in one form of repairing split planks and in connection with the gunwale lashing of a model double canoe. The eastern technique was thus known in Samoa but its general use was evidently supplanted by the flange method. The historic discussion by the Samoan guild of builders as to whether sennit braid should be used first on the house or the canoe associates the introduction of the Samoan canoe technique with that of the house with the rounded ends. There is no evidence that the flange canoe technique ever reached the Society Islands.

Outrigger. Details of the various forms of outrigger construction in the different parts of the eastern area require to be recorded and analyzed before full comparisons can be made between east and west. If New Zealand, the Marquesas, and Hawaii are regarded as retaining the oldest form of culture in the five-piece canoe, Hawaii owing to the absence of the specialized projection of the bow and stern pieces, may be regarded as retaining a simpler and older form than the other two. If this is so, the Hawaiian form of direct attachment between the outrigger boom and the float assumes a significant value. The Hawaiian booms are strong stiff pieces with an outward downward curve to meet the lower level of the float. The Marquesan boom, according to Linton (19, p. 309), was connected indirectly with the float by four to six sticks, the present stave connection being a modern invention. In New Zealand, though the outrigger was eventually abandoned, an old float discovered in Moncks Cave and described by Skinner (30, p. 364) shows by the presence of holes for connecting pegs that the indirect form of attachment had been in use. The indirect form of attachment is the common form in the eastern area. In the Society Islands, however, a mixed technique exists in that the fore boom is indirect and the aft boom direct. For security, the float depends upon the stout fore boom with the firm attachment of indirect pegs and a suspensory cord. The aft boom is thinner and purposely so selected for its flexibility to enable it to give to the movement of the waves. In the larger canoes, the boom runs out horizontally from the gunwale and then curves down to meet the upper surface of the float to which it is directly attached by a lashing passing through a hole cut through the float. In the small canoes, the aft booms looks ridiculously thin and frail. They are formed of a short length of thicker wood from which a thinner branch springs. The thicker piece is lashed to the two gunwales with the thin branch projecting

upwards and outwards on the left side of the canoe. The thin branch is then bent over in a curve with its arch projecting well above the level of the gunwales. The outer end is attached to the float either directly by insertion into a hole on its upper surface or indirectly by lashing to a wooden peg driven into the float. A metal nail now usually takes the place of the peg. The slender boom is usually lashed to the peg so that it touches the float but cases were seen in which the boom was lashed to the peg a couple of inches or so above the float. Thus even with the slender aft boom both a direct and an indirect form of attachment occurred. The attachment of the aft boom in the Society Islands marks a local development and creates another point of divergence from the Samoan canoe technique in which a rigid straight aft boom is attached to the float by four longer indirect pegs in the same manner as the fore boom.

Peg lashings. Another curious development in Tahiti is the method of lashing the float peg connections to the fore boom. After inserting the sharpened lower ends of the pegs into holes in the float, the upper ends are brought against the sides of the boom either singly or in pairs. The single pegs have the upper ends projecting above the boom and the lashings consist of oblique turns taken round both elements and finished off with transverse turns taken round the oblique turns between the peg and the boom. The paired pegs, however, have the upper ends cut obliquely to fit accurately against the sides of the boom without projecting above it. The two pegs and the boom on either side of the meeting point form four arms. The commencement end of the lashing braid is fixed and then makes a complete turn round each arm in turn, the crossing over from one arm to the adjacent arm being on the upper surface. The turns are continued, each round being on the outer side of the previous round and close to it. The technique is wrapped work and is the same as that of the New Zealand fly flap. A large single lozenge-shaped pattern is produced on the upper surface of the boom with the points extending along the boom on either side and along the pegs fore and aft. The upper ends of the two pegs are completely concealed. In the Samoan lashing, as we have seen, the ends of the paired pegs project above the sides of the boom and are never concealed. The lashing is by ordinary crossed diagonal turns which result in a lozenge pattern on the outer side of each peg but which are of totally different construction to the fly flap lozenge on the upper surface of the Tahitian boom.

The sail. The difference between east and west in the setting of the sail has been remarked by Linton (19, pp. 318, 450). In both areas, the matting sail was triangular. In the east, the apex of the sail was at the foot of the mast. One side was attached along the mast whilst the free side had a sprit or boom attached along its edge. In Samoa, both sides of the sail had sprits

termed *tila* attached to their edges. The apex of the sail was fixed forward of the mast. A rope was tied to about the middle of the upper *tila* and passed through a special support at the masthead. By means of the rope the sail was hauled up into position with its long axis oblique.

FISHING

Fishing methods employing narcotizing, spearing, sweeps of coconut leaves, walled traps, and nets made with netting needles and mesh gages are similar in principle in both areas. In Samoa, the purse net with two wings set like a V-shaped weir is common. Trolling for bonito with an unbaited hook with a pearl shell shank attached by a line to a bamboo rod is similar in principle in the two areas but there are variations in the shape of the hook point, the hook lashing and the method of setting the rod. Albacore fishing with a double canoe and a crane which is a marked feature of the Society Islands is not known in Samoa. Fishing with a baited hook from a fast sailing canoe for dolphin is similar in Samoa and Tahiti. In Samoa, the dolphin is known as *masimasi* and in Tahiti as *mahimahi*. Apart from the *masimasi* hook and the poor specimens described, Samoa is devoid of baited hooks. The shark hook was unknown and the method of noosing prevailed in its stead. Deep line fishing was absent and there is no authentic evidence to show that the deep sea *Ruvettus* was ever caught on a long line with a baited hook. The Samoans were thus surface fishermen. In the east, varieties of baited hooks occur and the shark hook is common. Linton (19, p. 402) records the shark noose in the Marquesas. The method used in Aitutaki, Cook Islands, of diving down and tying a clove hitch round the tail of sharks sleeping with their heads in crevices of the rocks cannot be regarded as a similar noose method. The catching of the *Ruvettus* has been shown by Nordhoff (22, p. 40) to have been originally confined to certain islands of the eastern area. Tahiti thus resembles Samoa in not having had a knowledge of *Ruvettus* fishing. Samoa is rich in varieties of fish traps but detailed technique from the various parts of the eastern area is lacking.

HUNTING

Traps. The principle of the bent sapling spring, the running noose and the trigger seen in the Samoan *mailei* trap to catch fowls and wild pigs was used in the fowl traps of the Cook Islands. It is also present in the rat traps of New Zealand.

The bow. The knowledge of the bow and arrow as shown by Linton (19, p. 452) was widely spread through east and west. In Samoa, it was used to shoot birds as well as fish and never as a weapon.

Net. The pigeon net of such importance in Samoa occupied no similar position in the eastern area. The dove decoy cage also seems confined to the west.

HORTICULTURE

Terraced irrigation. In the eastern area, the terraced irrigation of the taro (*Colocasia antiquorum*) forms a marked feature. The water is tapped at a higher level of the stream and conducted down by a main irrigation channel to flats formed by bends of the stream or to where the narrow stream defile opens out into a broader valley. The lower margins and sides of succeeding terraces are built up and faced with stone. Some areas are large in extent and must have involved considerable labor and ingenuity. Terraced irrigation naturally requires streams with a fair fall. The method exists not only in the east central area but also in the marginal localities of Hawaii and the Marquesas. In Samoa, terraced irrigation is absent in spite of suitable streams.

GAMES

Common to east and west. Of seven games tabulated by Linton (19, p. 453), the surfboard and dart throwing are given as common to both areas. Though dart throwing is given merely as present in Samoa and important in some of the eastern localities, the association of the game in Samoa with historical events and oft quoted sayings used by orators shows that it was equally important in the west. The use of the throwing cord with forms of dart throwing has been remarked.

Bowling and coasting which Linton gave as not present in Samoa, have been shown to be definitely present. The important Samoan game of *lafonga* played with coconut shell discs is present in Mangaia, Cook Islands, in the form of round wooden discs which are pitched in the same way for position on a mat. In both Samoa and Mangaia, the discs are termed *tupe*.

Eastern area alone. Linton has drawn attention to stilts, kites, and a draft game present in various eastern localities not being present in Samoa.

Western area alone. Of Samoan games not recorded from the east, I can only think of the water tip-cat game of *tapalenga* and the *fiti* game of jackstraws.

MUSICAL INSTRUMENTS

Shell trumpets of *Triton* and *Cassis* shell and the mouth flute are found in both areas. The true drum made of an upright hollowed log with shark skin stretched over the upper end is characteristic of the east and absent in the west. The eastern drum was important in the ritual connected with the

religious stone structures and extended from the central area to the marginal localities of the Marquesas and Hawaii. In New Zealand, where the elaborate stone structures were absent, the drum was absent also.

The wooden gong made of a hollowed log with closed ends and a narrow slit-like opening is characteristic of the western area. The history of the slotted gong in Samoa is peculiar in that the true Samoan *nafa* form has disappeared whilst the two larger forms present are said to have been introduced from Fiji and Tonga. The small *pate* form is also stated to have been introduced from Tahiti by missionaries. The small *pate* gong is present in the east central area. A larger well carved form known as *kahara* in the Cook Islands is enumerated in tradition in the list of things used in the ancient *takurua* ceremonies at Atia-te-Varinga, which Percy Smith located in Indonesia.

As Linton points out (19, p. 453), the nose flute is present in the eastern area but is absent in Samoa. Pan's pipes are present in Samoa as well as Tonga but are absent in the east. Though the specialized form of Jew's harp described by Linton (19, p. 408) in the Marquesas is absent in Samoa, the child's toy of a stiff piece of wood or a dry coconut leaflet midrib vibrated against the teeth was used in Samoa as well as in the eastern area.

WEAPONS

At the present time, the comparative study of weapons can best be made in Museums whither most of them have gone. One feature, however, may be remarked on here. Samoan clubs are marked by a variety of forms but they are all short, rarely exceeding four feet in length. They are mostly made for striking with one end whilst the proximal end is flared and blunt. The characteristic weapons of the Society and Cook islands are marked by their greater length. While the distal ends are pointed for thrusting, they are also expanded into cutting blades which are variously treated. They are much lighter and more delicately made than the corresponding parts of the Samoan clubs. Another most important feature is that the proximal ends may be pointed and are thus capable of being used to deliver a back handed thrust. The principle of the double ended offensive weapon shows a marked advance in military science and is found still better utilized in the shorter weapons of New Zealand. Curiously enough, the principle is not recorded from the other parts of the eastern area. The difference between the Samoan and the Society Islands clubs is thus not only in form but in the whole question of attack and defense.

SUMMARY

The data from Samoa would indicate that canoes with topsides or planks joined together by the right-through lashing and with the use of the covering

batten over the seam was widely used over the whole Polynesian area. Associated with it was the rectangular house with wall posts and wall plate erected before the principal rafters were put up. Distribution also indicates that with this wide-spread early culture was associated a knowledge of the bow and arrow, slings, and such games as dart casting with and without the use of the throwing cord, bowling with discs and string figures.

Certain culture traits, such as the marae type of religious stone structure, stone figures, stone food pounders, upright drums covered with skin at the upper end, and the nose flute, passed into or developed in eastern Polynesia without affecting Samoa. Associated with the worked stone complex was the tendency to improve the technique of the stone adzes used in the crafts.

The striking features distinguishing Samoan material culture from the general culture of eastern Polynesia are the arched houses and the flanged plank canoes. The other minor differences are not so striking when taken individually but grouped together they form a total that cannot be disregarded. Special efforts which resulted in improved technique were closely related with class distinction. Builders and tattooing artists obtained their most lucrative employment from the higher classes and used their crafts to still further accentuate social distinctions. Craftswomen were stimulated to their greatest efforts in developing the technique of bark cloth, shaggy garments, and fine mats through the material articles being utilized as the outward expression of social status.

The builders' guild in Samoa seems to have had more set rules of organization than their fellow craftsmen of eastern Polynesia. The definite rules of agreement in house building, with reciprocative prohibitions and definite immediate rewards during stages of the work, mark a business advance on the usual Polynesian attitude towards community labor while the actual development of a form of trade unionism with strikes and tabooing of employers, is an evolution in labor based on a commercial instinct foreign to eastern Polynesia. The usual Polynesian system of reciprocal labor, feasts and presents, is a fluid method that allows of time and opportunity in which to make payment on a credit system based on trust and honor. The Samoan system demands immediate provision of food and payment and is so businesslike in its commercial bearing that the question arises as to whether the commercial principle underlying it is a purely local development or a diffusion from some higher culture to the west which did not spread further east than Samoa.

While the kava plant reached eastern Polynesia, the elaborate ceremonial associated with it in Samoa is lacking. The talking chiefs of Samoa were the systematizers of custom and usage. Their efforts in exercising their office resulted in a mass of ceremonial observances that included a set order of prestige among families and villages and the use of a distinct ceremonial

language. The talking chiefs thus rendered themselves indispensable in enabling high chiefs to comply with the etiquette demanded of their position. Much of the ceremonial has been developed locally but some elements may have been brought from the west and adapted to suit local conditions. Handy (14 *a, p.* 327) believes the ceremony connected with kava drinking to be adapted from the Buddhist ceremonial tea drinking. Ceremonial kava drinking and the guild of builders (Sa Tangaloa) are both associated with Tangaloa. As neither the elaborate kava ceremony nor the trade unionism of the Tangaloa builders reached eastern Polynesia, it may be surmised that they were both elements of a culture that diffused from the west as far as Samoa and its neighborhood and reached no further. Samoan material culture, apart from the elements rendered important by association with rank, was uninspired. It is not in the arts and crafts but in social organization and elaborate ceremonial that the peculiar genius of the people sought a congenial sphere of activity and found its greatest expression.

The kava is finished,
The strainer is dry,
The chiefs from afar have emptied the bowl,
And nought remains but the dregs.

LITERATURE CITED

1. Beasley, H. G., Pacific island records: Fishhooks, London, 1928.
2. Bougainville, L. A., A voyage round the world . . . 1766-1769 . . . , translated by John Reinhold Forster, London, 1772.
3. Brigham, W. T., Mat and basket weaving of the ancient Hawaiians: B. P. Bishop Mus., Mem., vol. 2, no. 1, 1906.
4. Brigham, W. T., Ka hana kapa: B. P. Bishop Mus., Mem., vol. 3, 1911.
5. Churchill, William, Club types of nuclear Polynesia: Carnegie Inst. Washington, Pub. 255, 1917.
6. Churchill, William, Manuscript on Samoan linguistics, in Bernice P. Bishop Museum.
7. Churchill, William, Samoan kava custom: Holmes Anniversary Volume, pp. 53-66, Washington, 1916.
8. Churchward, W. B., My consulate in Samoa, London, 1887.
9. Demandt, E., Die Fischerei der Samoaner: Mus. f. Völkerkunde, Hamburg, Mitt. 3, Heft 1, 1913.
10. Edge-Partington, James, An album of the weapons, tools, ornaments . . . of the Pacific islands, 3 vols., Manchester, 1890-1898.
11. Ella, Samuel, Polynesian clothing: Polynesian Soc., Jour., vol. 8, pp. 165-170, 1899.
11*a*. Ella, Samuel, The Samoan "Taumua-lua": Polynesian Soc., Jour., vol. 7, p. 247, 1898.
12. Fraser, John, Some folk-songs and myths from Samoa: Polynesian Soc., Jour., vol. 5, pp. 171-183, 1896.
12*a*. Fraser, John, Some folk-songs and myths from Samoa: Polynesian Soc., Jour., vol. 6, pp. 106-122, 1897.
13. Gudger, E. W., Wooden hooks used for catching sharks and *Ruvettus* in the South Seas: Am. Mus. Nat. Hist., Anthropological papers, vol. 28, pt. 3, 1928.
14. Handy, E. S. C., and Handy, W. C., Samoan house-building, cooking, and tattooing: B. P. Bishop Mus., Bull. 15, 1924.
14*a*. Handy, E. S. C., Polynesian religion: B. P. Bishop Mus., Bull. 34, 1927.
15. Henry, Teuira, Ancient Tahiti: B. P. Bishop Mus., Bull. 48, 1928.
16. Hornell, James, String figures from Fiji and western Polynesia: B. P. Bishop Mus., Bull. 39, 1927.
17. Judd, A. F., Manuscript notes on ethnology of American Samoa, in Bernice P. Bishop Museum, 1926 (also 1927).
18. Kramer, Augustin, Samoa-Inseln, 2 vols., Stuttgart, 1903.
19. Linton, Ralph, The material culture of the Marquesas Islands: B. P. Bishop Mus., Mem., vol. 8, no. 5, 1923.
20. Marquardt, Carl, Die Tattowirung beider geschlechter in Samoa, Berlin, 1899.
21. Mason, O. T., Aboriginal American basketry: Smithsonian Inst., Washington, Ann. Rept., 1902.
22. Nordhoff, C. B., Fishing for the oilfish: Am. Mus. Nat. Hist., Natural History, vol. 28, no. 1, pp. 40-45, 1925.
23. Pratt, George, Grammar and dictionary of the Samoan language, 4th ed., Samoa, 1911.
24. Pritchard, W. T., Polynesian reminiscences, London, 1866.
25. Reinecke, F., Die Flora der Samoa-Inseln: Engl. Bot. Jahrb., vol. 25, 1898.
26. Rivers, W. H. R., and Haddon, A. C., A method of recording string figures and tricks: Man, vol. 2, no. 109, pp. 146-153, Oct., 1902.

27. Roogevein (quoted by W. Churchill in manuscript in Bernice P. Bishop Museum).
28. Schultz, E., Sprichwörtliche Redensarten der Samoaner, Apia.
29. Setchell, W. A., American Samoa: Carnegie Inst. Washington, Pub. 341, 1924.
30. Skinner, H. D., The outrigger in New Zealand and Tahiti: Polynesian Soc. Jour., vol. 36, pp. 363-365, 1927.
31. Skinner, H. D., The Morioris of Chatham Islands: B. P. Bishop Mus., Mem., vol. 9, no. 1, 1923.
32. Smith, S. P., Hawaiki: Polynesian Soc., Jour., vol. 7, pp. 137-177, 1898.
33. Stair, J. B., Old Samoa, London, 1897.
34. Stair, J. B., O le Fale-o-le-Fe'e: Polynesian Soc., Jour., vol. 3, p. 241, 1894.
34*a*. Stair, J. B., Mythology of old Samoa, Polynesian Soc., Jour., vol. 5, pp. 31-57, 1896.
35. Stokes, J. F. G., Manuscript on walled fish traps, in Bernice P. Bishop Museum.
36. Sterndale, R. A., Prehistoric remains in Samoa: Polynesian Soc., Jour., vol. 1, pp. 62-64, 1892.
37. Sullivan, L. R., Samoan somatology: B. P. Bishop Mus., Mem., vol. 8, no. 2, 1921.
38. Te Rangi Hiroa (P. H. Buck), The evolution of Maori clothing: Polynesian Soc., Mem., vol. 7, 1926.
39. Te Rangi Hiroa (P. H. Buck), The material culture of the Cook Islands (Aitutaki): Board of Maori Ethnological Research, Mem., vol. 1, 1927.
40. Turner, George, Nineteen years in Polynesia, London, 1861.
41. Turner, George, Samoa, London, 1884.
42. Wilkes, Charles, Narrative of the U. S. exploring expedition, 5 vols., Philadelphia, 1844-1845.
43. Williams, John, Missionary enterprises in the South Seas, New York, 1837.
44. Winton, A. L., Anatomy of the fruit of *Cocos nucifera*: Am. Jour. Sci., 4 ser., vol. 12, no. 70, 1901.

EXPLANATION OF PLATES

PLATE I.—*A,* cooking house (*fale umu*) at Fitiuta, Tau; length 18 feet 4 inches, width 11 feet 7 inches; *utupoto* type with side supporting posts, tie beams, and king posts; thatch of plaited coconut leaves, uncut at eaves; no wall screens; no raised floor; *B,* long house (*faleafolau*), with wall screens (*pola*) down at one end; stone platform and coconut leaves plaited around two wall posts for decorations; native ladder (*atolau*) used in thatching and repairing the roof; *C,* round guest house (*fale tele*) at Fitiuta, Tau; length 31 feet 7 inches; width 27 feet 6 inches, height of supporting post to ridgepole 20 feet; thatch of sugar cane leaves, cut at the eaves; wall screens raised to show circumferential wall posts; low stone platform built up after completion of house; short ridgepole above corresponds with length of middle *itu* section, bounded by rounded *tala* on either end; *D,* long house on stone platform, showing ridge and rounded ends; coconut leaves are placed over the sugar cane leaf thatch with tip ends knotted over ridge to protect thatch from blowing up with the wind.

PLATE II.—*A,* Inside view of *tala* rounded end of a long house; the high side supporting posts bear the *utupoto* cross tie beams; the mesial longitudinal beam above the tie beams is the *tuitui,* which is lashed to each tie beam with an ornamental sennit lashing; the *tuitui* beam supports the king posts which in turn support the main ridgepole; to the outer side of the upper ends of the side supporting posts are the main plates (*amo pou*), while resting on the outer ends of the tie beams are the purlins known as *tatao*; below the *tatao* are straight main purlins supported by side struts (*te'e*) running obliquely up from the sides of the supporting posts; below again is the ordinary wall plate, also called *amo pou,* to which are lashed the side wall posts (*pou lalo*); the rounded end has the wall screens down on the outside of the end wall posts; these posts support the curb plate (*fau lalo*); above the curb plate are the arched purlins (*fau*), the fourth being the middle *fau tu,* whose lower ends reach the junction of the wall plate and curb plate; above the *tatao* purlins on the sides, may be noted two intermediate purlins (*luanga*) followed by a main purlin (*amoamo*); between the main purlins may be seen a pair of *so'a* collar beams; the narrow thatch rafters (*'aso*) can be seen to the outside of the other elements. *B,* End scaffolding of house with curb plate and arched purlins kept in temporary position by temporary struts: the thatch rafters (*'aso*) are attached in the middle line to get the longitudinal curve of the end roof. *C,* Side view of round house in construction, showing middle section and left rounded end with roof thatched. Right end section gives good view of scaffolding, curb plate, oblique direction of arched purlins, and thatch rafters in middle line. The arched purlins show the transverse curve of the roof and the mesial thatch rafters, the longitudinal curve.

PLATE III. *A,* thatching needles (*lavelau*): 1, length 11 inches, diameter 0.4 inch, hook point and notched end with loop for carrying over wrist; 2, length 14.75 inches diameter 0.4 by 0.5 inch near hook and 0.5 by 1.4 inches in middle, both ends hooked with barb on opposite sides; 3, length 15 inches; thickness 0.2 to 0.3 inch and 0.4 inch deep near hook to 0.8 inch at proximal end; *B,* Brooms: 1, with handle (*salu tu*); stick used as handle with leaflet midribs arranged around one end and lashed with sennit braid; 2, handbroom (*salu lima*), green coconut leaflet midribs torn from leaf with narrow strips of leaf midrib adhering; the strips are plaited together in three-ply braid, midribs then rolled together and lashed with sennit braid at part which forms handle. *C,* Thatching paddle (*alai*) made of heavy wood: blade 2 feet 3 inches long, width 3.1 to 3.3 inches, thickness 0.5 to 1 inch, handle, round section 1.7 inches in diameter, total length 7 feet. *D,* Types of pillows: 1, Upolu type of pillow made of two sections of bamboo; lower section, length 16 inches formed of one internode with ends closed by nodes, diameter 3.5 inches, bottom cut away to form level surface to rest on floor, mesial strip 0.6 inch wide on upper surface formed by cutting away a strip 0.8 inch wide on either side, 13.25 inches long, and cut through at one end to form tongue; top piece 12.5 inches long, no nodes, slipped along under tongue of lower piece, rests on

grooves of lower piece while tongue keeps it in position; made by order of high chieftainess Kalala for Bishop Museum; 2, bamboo 3 inches in diameter, length two internodes with nodes at ends left on to close ends and prevent lashings of legs slipping off, legs (*vae 'ali*) of *pualulu* wood, *v*-shaped with natural junction, height of legs 3.75 inches, lower spread 7.75 inches, lashing with sennit braid around circumference of bamboo; 3, bamboo length two internodes of greater length, lashing through holes bored through bamboo from side to side.

PLATE IV. *A,* Fire-making appliances: two fire sticks of *fau* wood, lower stick with groove (*mata si'a*), upper active stick with blunt point (*ngatu*); position of hands holding stick, fingers in front, thumbs crossing behind; particles of wood from friction collected in forward end of groove. *B,* Tongs (*iofi*) of bent coconut leaf midrib used to pick up hot stones to rearrange them around food in earth oven, or to cook liquid food in a wooden bowl; length 1 foot, material 0.5 inch wide and 0.75 inch deep. *C,* Shell scraper (genus *Tonna*) with circular opening cut through the whorls, and edges of opening used to scrape *talo* and breadfruit. *D,* Water bottles, empty coconut shells cleaned out, fastened in pairs (*taulua*) with sennit braid and two pairs tied together, for obtaining fresh water at springs, carried on short carrying pole (*amo*), two pairs at each end (Tau, Manua). *E,* Coconut shell scraper (*'asi*), half coconut shell used for scraping *talo* and breadfruit, the lower left part of the circumference has been cut down to an edge.

PLATE V. *A,* Coconut-grater models: 1, side view; 2, top view; tripod of wood (*'ausa'alo*) with projecting limb to which is attached piece of coconut shell (*tuai*) against which flesh of mature nut is grated in preparation of coconut cream (*pe'epe'e*). *B,* Climbing bandage (*aufanga*); two strips of *fau* bark 0.75 to 1 inch in width, tied into a loop with a reef knot to make a loop 1 foot 2 inches long; the feet are inserted to the instep and the bandage grips against the coconut tree trunk as the climber ascends. *C,* Coconut cream wringers (*tauanga*): preparing a wringer by splitting off narrow strips from *laufao* stem with a wooden *fofo'e* peeler; the thin strips are laid on a banana leaf and afterwards rubbed between the hands and formed into a tangled mass. *D,* Wringers: 1, of *laufao* made from the strips in (*C*); 2, of coconut husk fibre (*pulu*), beaten, cleaned, and tangled together; the grated coconut is enclosed in the wringer and the cream wrung out into a wooden bowl. *E,* (B 89113) Stone grater (*tuai ma'a*) lashed with sennit in lozenge pattern to wood representing the free arm of the *'ausa'alo* tripod frame. Prepared specially for A. F. Judd at Tau, Manua.

PLATE VI. *A,* Breadfruit pickers: 1, X-shaped picker; a 15-inch rod sharpened at both ends is lashed diagonally to a long pole near the sharpened thinner end; the fork so formed engages the stalk of the breadfruit, which is twisted off and falls to the ground; the rear angle may also be used to hook off the fruit. 2, Netted picker: a pole with a natural fork has a bag net of sennit braid attached to the limbs of the fork; the fruit stalk is engaged by the fork and the fruit twisted off into the bag net, which saves it from bursting on stony ground; used at Fitiuta, Tau. *B,* Breadfruit pounder (*autu'i*) formed of breadfruit, with four *fau* sticks projecting 9.5 inches inserted around the circumference of the stalk attachment to form a handle; used in pounding cooked breadfruit for the *taufolo* preparation. (Cast by G. P. Wilder.) *C,* Pounding cooked breadfruit with breadfruit pounder; assistants flick out seeds and hard parts with a piece of wood called *i'o fatu.*

PLATE VII. *A,* Breadfruit splitters (*to'ipua* or *to'i'ulu*) made of the branch of a tree (*pualulu*) to form a blade; measurement in inches:

	1	2	3	4
Blade, length	7.75	8.1	8	8.8
Blade, width	2.5	2.3	2	2.4
Handle, length to lower part of blade	9.5	10.5	8.4	10.25

The splitters (1) and (2) have no heel projecting above the line of the handle, while (3) and (4) have a projecting heel. *B*, Carrying pole (*amo*) of *fau*, 6 feet 5 inches long and 2 inches in diameter shaped into knobs at the ends to prevent burden from slipping off. *C*, Woman scraping breadfruit with coconut shell scraper; breadfruit rests on wooden peg covered with coconut husk fibre; the peg (*valusanga*) is stuck in ground just outside cook house. (Savaii.) *D*, The carrying pole in use: ordinary pole with notches cut in the ends; the outer edge of the midrib rim of baskets fits into the notch.

PLATE VIII. *A*, Kava roots and mortars: 1, root with part of stem left as a handle to form *tungase*, given ceremonially to visiting chiefs; 2, larger *tungase*; 3, *'ava uso*; the thin roots of kava bundled together and presented to visiting chiefs who are related (*uso*, brother), given to Bishop Museum expedition at Vailoa in recognition of the Polynesian brotherhood of Samoa, Hawaii, and New Zealand; 4, small kava mortar used in braying root for one person; 5, large stone used as kava mortar, formerly a grinding stone for stone adzes, obtained at Nu'uali, Tutuila; also natural stone used as pounder. *B*, Coconut shell kava cups (*ipu'ava*): 1, large, shallow cup with hole bored through *muli* projection to support cord; 2, large, deep cup; 3, smaller, average-sized cup; 4, cup made of ordinary drinking nut, used in kava-naming ceremony. *C*, Kava strainers (*to tau 'ava*): 1, newly made strainer of *fau* bast looped over a supporting strip of bast; 2, old strainer tangled up after continued use.

PLATE IX. Round kava bowls (*tanoa 'ava*) with wide rim surfaces directed upwards provided with legs and suspensory lugs. *A*, (2145) Top and back view: outside diameter 16.25 inches, inside depth in center 4 inches, outside depth 7.5 inches, thickness near rim 0.5 inch, width of upper surface of rim 1 inch, external surface sloped out, forming sharp outer rim edge; average diameter of legs near attachment 3 by 2 inches, at lower end 1.8 by 1.7 inches. In the *v*-shaped lug each arm is 2 inches long, thickness at junction 1 inch, depth 1 inch, arms with sharp free edge, ends cut at a slant. *B* (C880), Top and back view: outside diameter 20.25 inches, inside depth 5 inches, outside depth 7.5 inches; the width of the upper rim surface 1.1 inches, narrow outer part of width 0.3 inch, slightly raised, cut with parallel, oblique lines 0.2 inch apart for ornamentation. Outer edge of leg junction 0.5 inch from rim. Originally there were five legs, but one directly opposite suspensory lug had been cut off, the outer surface of the bowl trimmed evenly over the junction, while a long oval of different color marked the site. *V*-shaped lug with short arms; depth 0.5 inch, free edge, sharp. Diameters at junction in the leg are 4.3 by 2.2 inches; diameters at lower end 1.4 by 1.1 inches. *C* (2151), Back view: outside diameter 20.5 and 19.5 inches, inside depth 4.75 inches, outside depth 7.75 inches. The outer and inner surfaces inclined toward each other form narrow rim surface 0.4 inch in width. *V*-shaped lug is solid. *D* (8186), Back view: outside diameter 16.25 inches, inside depth 3.5 inches, outside depth 7 inches. There are 12 legs 0.25 inch from bevelled outer edge of rim, quadrangular in section.

PLATE X. *A* and *B*, Upper and back view of elliptical kava bowls, rim at ends prolonged, with four legs, and suspensory lug: *A* (6000), inside long diameter 13.5 inches, cross diameter 11.6 inches, inside depth 3.5 inches, outside depth 5 inches; rim surface width in middle transverse line 0.25 inch, at pointed ends 0.75 inch; suspensory lug, straight projection with long axis parallel with rim. *B* (2150) Inside long diameter 11 inches, cross diameter 9 inches, inside depth 3.25 inches, outside depth 4.75 inches; rim upper surface width in middle transverse line 0.2 inch, at pointed ends 1.25 inches; *v*-shaped lug with two arms almost in same straight line, both curved on free edge, making the deeper apical part project downwards in a blunt point. *C* (2146), Round bowl: outside diameter 17.25 inches, inside depth 4 inches, outside depth 5.75 inches, thickness near rim 0.4 inches, width of rim surface 0.55 inches. Legs with outer concave curve. *T*-shaped lug. *D*, Large, round *masoa* bowl for preparing arrowroot. Circular opening 2 feet 3.75 inches in diameter. Depth in center 9.5 inches. Rim plain with slight bevel from outer circumference to meet outer surface of bowl. Handles formed of four projections cut out of solid and set at equal distances around the rim. Attachment

to bowl 4 to 5 inches wide, 1.5 inches deep, projection outwards 1.5 inches, acute-angled groove 0.3 inch deep between handle and rim to maintain rim bevel; handles rounded off transversely with vertical diameter of 2 inches; the ends are cut off square. The cavity of bowl is evenly concave in all directions. Outer surface, when inverted, is dome-shaped. Four legs evenly spaced about 4.5 inches from center; lower ends round in section, 1.5 inches in diameter, attachment oval with long diameter of 2.25 to 2.5 inches in line radiating from center; cross diameter 2 inches, broader end internal, height on inner side 1.25 inches, height from rim to ground 11 inches.

PLATE XI. *A*, Roof sheets of plaited coconut leaf (*laupola*): length 7 feet, depth 14 inches; right and left sides of leaf plaited separately; end edges plaited; upper edge formed by midrib; lower edge by free leaflet ends; check stroke; used in pairs. *B*, Ridge sheet of coconut leaf (*fa'atafiti*): upper surface, middle whole leaf and split half leaves on either side with leaves interlaced. *C*, Ridge sheet: under surface, which is turned upward when placed over upper ridgepole.

PLATE XII. *A*, Wall screens (*pola sisi*) made of coconut leaf; length 3 feet, depth 12 inches; 1, vertical rows of twill; 2, geometrical design of large triangles; 3, smaller triangles; 4, back showing course of dextral wefts passing over upper edge to be included in finishing braid. Braid tail on right upper corner fixed by passing back through wefts. *B*, Coconut leaf rough baskets (*'ato*); 1, *'ato fili tasi* with one line of braid at the bottom finish; split mibrib rim in one piece; 2, *'ato fili tolu* with round finish at bottom but rest of technique same as (*B*, 1). *C*, Temporary food platters: 1, *mailo* platter used for serving *fa'ausi* food preparation to high chiefs; 2, *laulau* platter made of green leaflets in check and discarded after use. *D*, Permanent *laulau* food platter plaited in vertical rows of twill and kept for serving food to guests and family: 1, front lower border shows twist of leaflets and upper border the three-ply braid finish; 2, back lower border showing midrib strips carrying leaflet wefts; upper border with braid edging and braid tail on right inserted through wefts of body. *E*, Carrying sheet of coconut leaf (*laupolapola*): length 19 inches, width 23 inches; right and left sides of leaf split off, plaited in check separately, and joined down the middle with two-course, three-ply braid; used by women for carrying material on the back.

PLATE XIII. Plaiting *'ato* baskets: *A*, Plaiting of strip finished, dextral wefts turned down at top edge (below in Plate) and marginal free wefts projecting at both ends. Note odd leaflet left free on plaiter's right hand. *B*, Ends of plaiting joined by plaiting free marginal wefts of *A* together. Note dextrals turned down and free ends of sinistral wefts projecting upwards. *C*, Commencing first course of bottom closure in *'ato fili tasi*. The *so'o* join shown by weft crossing midrib rim in middle line. *D*, Second course of braided bottom closure completed and ends plaited on into free tail. *E*, Plaiting second course of bottom closure of *'ato fili tolu*. *F*, Finish of *'ato fili tolu* with braided tail, which is pushed through to inside of basket.

PLATE XIV. *A*, Coconut leaf fishing baskets (*ola*): 1, *ola malu* with rim of two midrib strips and two braided tails from bottom pushed through sides (Savaii); 2, *ola malu* with rim of one midrib strip with two half leaflets diverged at rim to form dextral and sinistral wefts. Note two-braid tails from bottom (Savaii). *B*, *Ola tu*, large basket with two midrib strips at rim to supply two opposite sets of wefts, plaited in horizontal lines of twilled-twos and used by women as a manipulated trap into which fish are driven from rock piles. *C*, Specialized types of coconut leaf baskets: 1, *si'u ola*, a better class of basket for containing fish, with rim of two midrib strips with leaflets twisted over each other, plaited in horizontal twilled-twos, and each course of bottom braid finished separately with braid tail at either end (Savaii); 2, *si'u ola*, same as (1) but deeper with twilled-twos running in vertical rows (Tutuila); 3, *'ato 'afa* chief's basket for containing sennit braid with more elaborate technique; width 19 inches, depth 11 inches; rim, four strips of leaf midrib, twill plait alternated in horizontal and vertical rows, and bottom finished with elaborate five-ply plait (Tutuila). *D*, Small coconut

leaf baskets: 1, breadfruit cover (*pulou 'ulu*) made of two sections of leaf plaited in check and finished at bottom with braid like *'ato fili tasi* and used to protect breadfruit (Manua); 2, basket similar to *D*, 1 but with three sections of leaf (Savaii); 3, basket with four sections of leaf (Savaii); 4, basket like Cook Island *ohini*, not much in use, probably introduced (Savaii).

Plate XV. *A*, Round coconut leaf baskets: 1, inside view, rim diameter 17 inches, depth 19 inches. Method of closing the bottom by plaiting in four quarter-sections shown and finished with three-ply braid tails, which are tucked under crossing wefts in the plaiting. 2, Side view with rim of four strips of leaf midrib with twill plait in vertical rows and bottom edge twisted to form round character of basket (Savaii). *B*, Inside view of round basket with different closure effected by carrying three-ply braid round in diminishing spiral and finishing off with thick braid (Savaii).

Plate XVI. *A*, Two samples of coiled baskets in which the coil foundation in split coconut leaf midrib and the coiling material pandanus leaf strips; the technique probably introduced and adapted to local material: 1, basket with long handle; 2, basket with rimmed, flat cover with central knob. *B*, Basket made of sennit braid with netting knot technique but with knot tied below the upper mesh instead of across it. This old basket was stated to have been for some generations in the family of the talking chief Manu of Safotu, Savaii, and was called by him an *'ato fa'apaupau*. They were used by carpenters for their tools and were then termed *'ato to*. The basket is 16 inches wide and 15 inches deep in the middle. *C*, Coconut leaf floor mat (*tapa'au* or *polavai*). The mat is a sampler but the full technique is present. Made of four strips of coconut leaf interlaced in the middle, plaited in check and finished off at the sides with three-ply braid. The free tail end of the braid is tucked under on the right and passed under crossing wefts. The tail is purposely left out on the left to show the technique. *D*, Pandanus leaf baskets of quadrangular shape probably derived from the old *tanga* type. Wefts of double thickness with the inner layer in check and the outer in twill. Colored elements overlaid to form design. Wefts cross at right angles to edges of basket. *E*, Basket of satchel type made of pandanus leaf in check with color introduced, serrated rim, and paired handles.

Plate XVII. *A*, Floor mats; 1, common type (*papa* or *paongo*), length 7 feet, width 2 feet 6 inches, double wefts of the *paongo* 1 inch wide used with check stroke; 2, floor mat (*fala*) larger than (*A*, 1), double wefts of *fala* 0.5 inch wide, used with check stroke. *B*, Baby mats (*fala lili'i*): 1, double wefts of *fala* 0.4 inch wide used in body with general check stroke spaced with rows of twill. Long edges with narrower wefts plaited in two separate layers with twilled-two stroke and free edges folded in; length of mat 38 inches, width 24 inches. 2, Double wefts of *fala* in two natural colors arranged to form squares in alternating colors with check stroke. Slits shown near long edge on right as also braid finish of long edge; size same as (*B*, 1). 3, Single wefts of *fala* in two natural colors more accentuated than in (*B*, 2). Sides and edges in check and twill. Body worked with twilled geometrical motives bordered by single lines of check. Size same as (*B*, 1). *C*, Sleeping mats (*fala moenga*): 1, with serrated edges (*fa'atalatala*), check plait with longitudinal rows of twill, also overlaid plaiting in color for ornamentation; 2, with dextral wefts dyed black and plaited in geometrical design. Both dye and introduction of wool fringe at edges are modern.

Plate XVIII. *A*, Samplers of plaiting: 1, *fa'aalo* orthodox oblique plait showing double butt commencement and *fa'aulu* method of adding weft butts on left margin; 2, *tapito* plait with wide and narrow wefts alternating to form the technique called *lalanga atoa*; 3, *tapito* plait at right angles to edges with diagonal running twill 4, *tapito* plait showing weft butts below and on left at right angles to edges (compare direction of wefts with *A* 1) with method of turning back wefts at upper finishing edge, also alternate panels of oblique twill (*fa'afatuamanga*). *B*, Cordage material: 1, coconut (*niu'afa*) 13 inches long, used in making sennit braid (*'afa*); 2, ordinary nut split to show fibrous husk (*pulu*) surrounding the nut; 3, longitudinal section of coconut husk

split for soaking in sea water before beating; 4, wooden anvil (*malaise*) with three legs upon which coconut husk is beaten after soaking in water; 5, wooden mallet (*sa'afa*) for beating coconut husk on wooden anvil; 6, two bundles of beaten husk with only fibres left (*matofi*). The fibre from each segment is kept separate by tying with a strand of fibre. *C*, Cordage: 1, scraped *fau songa* braided at one end to keep strips together when soaking in sea water and bleaching in the sun; 2, *fau songa* two-ply twisted cord barely 2 mm. thick made for smaller nuts; 3, *fau songa* fine three-ply twist 1.5 mm. thick, used for rod fishing inside the reef (*seuseu*) and also troll fishing with *pa ala* hook; 4, *ta'a* cord of three-ply for use with bonito hook and rod; 6, five-ply braid of *fau songa* 4 mm. wide and 2 mm. thick, probably used with *pa tangi* trolling hooks; 7, three-ply twisted cord of *matiata* 3 mm. thick, used in shark nets.

Plate XIX. *A*, Sennit fibres used in braid; 1, *matofi* bundle of beaten coconut fibres from one husk segment, which is kept separate by tying with strand of fibre; 2, *fa'ata'a* rolled strands of sennit fibre ready for braiding; 3, *to'oto'o ali'i* working material of *matofi*, *fa'ata'a*, and three-ply braid *'afa* being plaited. *B*, Sennit braid: 1, small working coil of sennit braid (*i'o fanga*); 2, loose coil of sennit braid (*tanganga*) in one-fathom coils; 3, permanent coil of sennit braid (*'afa mamanu* or *'afa manu fa'aso'a*).

Plate XX. *A*, Ropes (*maea*): 1, two-ply twisted rope of *fau* 9 to 11 mm. in diameter; 2, two-ply twisted rope of *fau* more neatly made than (*A* 1), 7 mm. in diameter and used for lines in suspending curtains; 3, commercial three-ply twisted rope used in making shark nooses 0.75 inch in diameter, or 19 mm.; 4, three-ply braid rope, each ply consisting of four strands of ordinary three-ply braid 15 mm. wide by 8 mm. thick, termed *'afa'afalua*; 5, five-ply braided rope 11 mm. wide by 6 mm. thick. *B*, Twist and braid: 1, two-ply twisted sennit; 2, three-ply braided sennit finer than usual, 2 mm. wide and 1 mm. thick with no doubled-over join or twisted *fa'ata'a*; 3, ordinary three-ply sennit braid 4 mm. wide and 2 mm. thick; 4, thicker three-ply sennit braid 6 mm. wide and 3 mm. thick; 5 four-ply round braid (*'afa langa fa* or *'afa anufe*) 2 mm. in diameter; 6, five-ply fine braid 3 mm. wide and 1 mm. thick; 7, five-ply thick braid 7 mm. wide and 4 mm. thick.

Plate XXI. *A* (L. 1570), ti-leaf kilt, four-ply braid waistband of *fau* strips to which ti leaves are added in two layers; width 2 feet 7 inches, depth 1 foot 8 inches. *B* (C. 727), Kilt of *fau* bast (*titi fau*) dyed yellow in *ango*. Strips of bast attached by two-cord commencement; width 5 feet 8 inches, depth 14 inches. *C* (C. 728) Kilt of *fangai'o* bast with 31 hanging strips ornamented with *fa'afeti'i* loops. Strips joined to a three-ply braid supporting band also ornamented with bast loops.

Plate XXII. *A* (C. 550), Feather kilt (*titi'ula*): green and white feathers attached to thin cords and plaited in a three-ply braid of bark cloth. Cords with feathers 8 to 9.5 inches deep; width of kilt 3 feet 2 inches. *B*, Bamboo frame for storing feather kilt constructed as follows: a length of bamboo 1 inch in diameter and 1 foot 7 inches long including a node at one end, is split longitudinally into 6 pieces, which are run up to the node. A strip of bamboo about 3 feet 5 inches in length and less than 0.25 inch wide is tied together at the ends with 2.5 inches overlap to form a hoop about 1 foot in diameter. The lower ends of the 6 divisions are tied at equal distances to the outer side of the hoop. Another smaller hoop about 9.5 inches in diameter is attached to the inner side of the six radials, 4 inches higher up than the marginal hoop. Six intermediate strips of bamboo are inserted at their upper ends into the spaces between the 6 radials, so that they rest in the upper tube below the node, while below they are tied to the outside of the two hoops midway between the radials. A strip of bamboo 5.5 inches long is tied at the upper part of the cage to two opposite radials. The *titi'ula* is folded into short, convenient lengths and suspended from the crossbar by tying; cage height 1 foot 7 inches, diameter at bottom 1 foot. *C* (L. 2071), Kilt of pandanus leaf (*titi laufala*) attached by two cords to waist; width 2 feet 10 inches, depth 1 foot 7 inches.

PLATE XXIII. *A* (C. 372), Kilt of *fau* bast plaited in check on single cord commencement; width 2 feet 3 inches, depth of plaiting 6 inches and fringe 1 foot 10 inches; wefts five or six to 1 inch. *B* (L.2264), Kilt of *fau* bast plaited in twilled-twos. Special attachment to two suspensory cords; width 2 feet 7 inches, depth of plaiting 6.5 inches; fringe 13 inches deep; rosettes and ornamentation in native material.

PLATE XXIV. *A*, textile Kilt (*'ie tutu pupu'u*): width 3 feet 4 inches, depth 11 inches; wefts four to seven to 1 inch; dyed with *lama* (black dye); fringe of three-ply braid tails with fringed ends 18 inches in depth at all edges, also intermediate fringe of weft ends on body. *B*, Textile kilt (*'ie tutu pupu'u*); width 4 feet 4 inches, depth 1 foot 6 inches to 1 foot 9 inches; material *fau*; dye *'o'a*; commencement corner on right upper corner which was lower left during plaiting; wefts four or five to 1 inch with 179 braided tails.

PLATE XXV. *A*. Garment kilt as worn. *B* (C.371), white textile kilt *fau pata*; width 2 feet 7 inches, depth 1 foot 6 inches; tags 6 to 7 inches long, wefts eight to twelve to the inch; braid fringe 10 to 11 inches long.

PLATE XXVI. *A* (C. 371), textile kilt showing check plait and wefts, eight to twelve to the inch (under side). *B* (C. 375), *'ie lavalava* made of fine mat pandanus material, check plait; width 3 feet 4 inches; eleven to thirteen wefts to 1 inch; braided tails at lower edge with free ends forming a fringe 15 inches deep; feathers tied to lower end of braid tails.

PLATE XXVII. *A*, Shaggy mat (*'ie fau*): width 3 feet 3 inches, depth 2 feet 6 inches to 2 feet 9 inches; material *fau*; natural color rich brown; double wefts five to ten to 1 inch; check plait; outer surface covered with tags. *B* (C. 729), Working edge of *'ie fau* garment showing oblique working edge and *fausa* wrappings of wefts not immediately in use, also horizontal line of tags attached to body of garment.

PLATE XXVIII. *A* (C. 730), *'Ie sina* garment in the making with clear, triangular commencement at lower left corner on dark paper, also showing the knotted *fausa* wefts with working edge over black paper with working dextrals spread out (Upolu). *B* (3570), *'Ie sina* shaggy garment; width 5 feet 10 inches, depth 3 feet 6 inches; ten wefts to 1 inch; outer coating of tags uncombed.

PLATE XXIX. *A* (2186), *'Ie ta'ele* shaggy garment made of *fau* and colored with red earth (*'ele*); width 4 feet 6 inches, depth 2 feet 11 inches; eleven wefts to 1 inch; tags 6 inches long; technique check plait. The lower left corner turned up to show the small, triangular commencement and the upper right corner shows the small braid finish resting on a piece of white paper. *B* (B. 9049), Kilt commenced with check plait; width 3 feet 9 inches, depth 1 foot 6 inches; covered with tags 8 or 9 inches long; eight or ten wefts to 1 inch; tags consist of ends of dextral and sinistral wefts; waist cords commenced from wefts at upper corners.

PLATE XXX. *A*, 1. Braid of discarded under layer carrying butt ends of the upper layer of the *lau'ie* pandanus for fine mats. After cooking and soaking in sea water, the leaves are cut off at braid and the latter discarded. 2, Leaf of *lau'ie* pandanus for fine mats. The under surface layer at lower butt end cut away and leaf cooked in earth oven in bundles. 3, Roll of prepared pandanus leaf (*lau'ie*) for fine mats. *B*, Lower left corner of fine mat, showing corner clear of fringe elements where plaiting commences. Left edge clear of fringe and lower edge fringed. *C*, Right upper corner of fine mat, showing three-ply braid finish of the mat. The braid is the last part done except the attachment of feathers. *D*, Fine mat (*'ie tonga*), showing functional lower border with weft fringes, pointed wide strips of pandanus *lau'ie*, and red feather ornamentation. The feathers usually extend right across, but here spaces are left which show up the attachment of the pointed strips. Note also the occasional long ornamental strip.

PLATE XXXI. *A*, Bark cloth beaters (*i'e*): 1 (B. 8920), Type round beater, ungrooved, length 16 inches, distal end elliptical cross section, diameters 2.5 and 2.3 inches. Handle diameter 1.4 inches, no shoulder between handle and head. Proximal end flared to diameter of 1.8 inches. Weight 27 ounces. 2, Round beater with shoulder; ungrooved; length 16 inches, distal end elliptical, cross diameters 2.5 and 2.1 inches, handle diameter 1.4 inches, marked shoulder 7.5 inches from distal end; handle not flared; weight 28 ounces. 3 (B. 8921), Three-sided smooth beater; length 14 inches, width of surfaces at distal end 2.8, 2.8, and 2.5 inches, handle diameter 1.4 inches; proximal end flared to 1.8 inches diameter; weight 28 ounces. 4 (B. 8914), Four-sided smooth beater; length 15.25 inches, distal end diameters 2.6 and 2.4 inches, proximal end of blade 2.0 and 1.9 inches; no shoulder; handle diameter 1.4 inches, proximal end with flanged knob 1.7 and 1.5 inches in diameter, weight 38 ounces. 5 (C. 760), Type four-sided beater; grooved; length 12 inches, distal end 2.7 inches in diameter, proximal end of blade 2.0 inches diameter, blade length 7 inches; slight shoulder handle diameter 1.5 and 1.6 inches, flared proximal end diameters 1.8 and 1.9 inches; three grooved surfaces with 5 grooves; weight 36 ounces. 6 (B. 8924), Four-sided grooved beater; length 12.5 inches, distal end diameters 2.9 and 2.8 inches, proximal end of blade 2.5 inches diameter; shoulder present; blade length 6 inches; handle diameter 1.6 inches; proximal end markedly flared to 2.1 and 2.3 inches diameter; two surfaces grooved with six and five grooves respectively; weight 42 ounces. 7 (B. 8925), Four-sided grooved beater; length 14.5 inches, distal end diameters 3.2 and 3.1 inches, proximal end blade 2.5 inches diameter; marked shoulder cut with bevel and then at right angles; handle diameter 1.4 inches, proximal end diameters 1.5 and 1.6 inches, forming slight knob; distal end pyramid form ending in point; two surfaces with eight and six grooves; weight 52 ounces. 8 (B.8915), Small, four-sided beater; length 8.5 inches; distal end 2.1 inches, proximal end blade 1.6 inches in diameter, handle diameter 1.2 and 1.1 inches; proximal end not evenly flared but slight increase to 1.2 and 1.3 inches in diameters. Grooves of five each on two adjacent surfaces; weight 16 ounces. 9 (B.8918), Four-sided foreign beater; length 18 inches; parallel sides 1.8 inches wide; handle 6.5 inches long and 1.5 inches in diameter; proximal end flared to 1.8 and 1.9 inches; four surfaces grooved with parallel lines ranging from 12 to 24 per surface; weight 38.5 ounces; obtained in Samoa, but probably from Tahiti or Austral Islands. *B*, Shells for scraping bast of paper mulberry: 1, *pipi* (*Asaphis violacea*) used in Tutuila in first stage of scraping; 2, *'asi valu* (*Arca*) used with untrimmed edge in Savaii instead of *pipi* in first stage of scraping off green coloring matter; 3, shell (*Antigone reticulata*) used in second stage with the rough outer surface as a rasp for loosening up the material, called *pae* in eastern Samoa, and *mangeo* in Savaii; 4, shell (*Arca*) with edge ground to an even sharp edge, used in third stage to smooth down surface after rasping process, called *fa'amalu* in eastern Samoa, and *pae* in Savaii; 5, shell (*Arca*) ground to a blunt even edge for expressing moisture from scraped bast in last stage of scraping called *ta* in Savaii and *langalanga* in eastern Samoa. *C*, *Fai u'a* or *valu u'a*; scraping the bast (*u'a*) on a board (*papa valu u'a*); motion of hands away from body; note wooden bowl of water beside board from which a shell full of water is every now and again dashed over the bast to assist in cleaning it. *D*, Beating the paper mulberry bark with an *i'e* beater on a wooden *tutua* anvil (Fangamalo, Savaii).

PLATE XXXII. Bark cloth and dyeing utensils: *A*, 1, *tata* wiper of bark cloth for painting wide spaces or rubbing designs on bark cloth; 2, *tusi fau*, large brush of *fau* fibre for painting bark cloth; 3, smaller *tusi fau*. *B*, Cloth process: 1, paper mulberry bast from one rod separated from the outer bark; 2, strip of bast after scraping and with the lower end beaten out to show the expansion that takes place; 3, prepared cloth from one strip of bast showing the thinness and tendency to form holes. The cloth in this stage is called *lau u'a* or *lau'a*. *C*, Wringer for obtaining *'o'a* dye; length 7 feet 3 inches, width 11 to 13 inches; made of *fau* bast in check plait; braided tails at one end for tying over a beam. *D*, Utensils: 1, *pupu 'o'a* coconut shell for holding *'o'a* dye, stoppered with dry banana leaf; 2, *ipu 'o'a* half coconut shell for holding *'o'a* dye while painting or

rubbing bark cloth; 3, *ipu lama*, half shell for *lama* dye of candlenut soot and *'o'a* mixed; 4, *ipu ango*, half shell for yellow *ango* dye made from grated turmeric root; 5, *ipu loa*, half shell for red *loa* dye. The above set were the equipment of a woman at Fangamalo, Savaii.

PLATE XXXIII. *A*, Straining *'o'a* dye: the scraped bark is laid out on the plaited wringer (*to tau 'o'a*) which rests on banana leaves, the wringer is rolled around the material, tied with cords, and suspended by the ends to a beam where it is twisted with a stick run through the loop formed by the wringer (Leone, Tutuila). *B*, Women rubbing cloth on *upeti* tablet of pandanus leaves tied to a section of canoe. The *'o'a* dye is in the small wooden bowl on her right and the white ball of arrowroot for pasting may be seen in the other small bowl. The *tata* wiper or rubber is in the right hand and the design from the tablet below may be seen showing on the cloth (Fangamalo, Savaii). *C*, Sections of painted and rubbed cloth: 1, piece of painted cloth (*siapo tusi*) in which the design is painted freehand on cloth made of full thickness before coloring; 2, back of painted cloth showing stains here and there where dye has soaked through but no design is apparent; 3, piece of rubbed cloth (*siapo elei*) with upper surface showing the clear design that was on a wooden tablet; 4, under surface of the rubbed cloth which was in direct contact with the tablet, showing the less distinct design formed by soaking through from the thin first layer.

PLATE XXXIV. *A*, *Upeti fala* tablet of pandanus leaf; length 36 inches, 15.75 inches wide; design divided into four sections by vertical panels of pandanus strip 1.5 inches wide; two left sections divided longitudinally by pandanus panels of three straight strips spaced with zigzag strips of pandanus between; smaller areas filled in with horizontal and oblique sets of parallel lines formed of two-ply twisted sennit cords averaging 1 mm. in thickness and varying from 3 to 5 mm. apart; two right segments also divided obliquely by pandanus strips both straight and zigzag; cords bound down with *fau* stitches 1 to 4 inches apart and running in rows over a series of parallels; sennit braid with ten loops on the upper edge, nine loops on lower edge, and ending in coiled loop, each loop 6 inches long. *B*, Pandanus leaf tablet tied to a long slab (*papa elei*) formed from the side of a canoe; the free coil of sennit seen in (*A*) is passed through the side loops below the slab and binds the tablet firmly down to the slab; on this the bark cloth is placed and rubbed with the dye. *C*, *Upeti papa*, tablet with design cut out on a slab formed from side of a canoe with steel tools.

PLATE XXXV. *A*, Sandals: 1, sandal of coconut husk (*se'e vae pulu*); length 7 inches, width 4 inches, thickness in middle over 1 inch; 2, sandal made of *fau* bast (*se'e vae fau*) 7 inches long by 3.25 inches wide; 3, sandal also made of *fau* bast 6.25 inches long and 4 inches wide; 4, rough sandal of fibrous material at base of coconut leaves (*lau'a'a*) hence called *se'e vae lau'a'a*. *B*, Monumental *tia* consisting of three tiers of natural stones raised over the grave of a high chief (Savaii). *C*, The Seat of Sina between the stone house (Le Fale o le Fe'e) and the basaltic cliff at the back composed of pieces of natural basalt; length 5 feet, width 4 feet, height 10 inches, slanting pillar 4 feet 8 inches long.

PLATE XXXVI. Front, back, and right side views of adzes: *A*, Type I. 1. (B.8937) 6 oz. (See fig. 173.) 2. (C.820) 15 oz. (See fig. 174.) *B*, Type II. 1. (C.788) 15 oz. (See fig. 179.) 2. (L.2029) 7.5 oz. (See fig. 180.) *C*, Type III. 1. (C.586) 5.5 oz. (See fig. 185.) 2. (C.796) Broken adz, weight 5 oz. (See fig. 186.) *D*, Type IV. 1. (L.2186) 5 oz. (See fig. 187.) 2. (C.812) 3.5 oz. (See fig. 188.)

PLATE XXXVII. Front, back, and right side views of adzes: *A*, Type V. 1. (L.1491) 10 oz. (See fig. 192.) 2. (C.807) 11 oz. (See fig. 193.) *B*, Types VI, VII and VIII. 1, Type VI. (C.825) 5-5 oz. (See fig. 195.) 2. Type VII (B.8940) 15 oz. (See fig. 197.) 3. Type VIII. (C.584) 4 oz. (See fig. 199.) *C*, Chisels. 1. (L.1566) Length, 94 mm., width, 31 mm. 2. (L.1565) (See fig. 211.) 3. (L.1483) (See fig. 212.) 4.

(L.1476) (See fig. 213.) 5. (C.345) (See fig. 214.) 6. (C.330) (See fig. 215.) *D*, Hafted adzes and haft. 1. Haft with projecting heel, single lozenge lashing. 2, Haft without projecting heel, adze butt entirely on toe of haft, chevron lashing. 3, Haft with projecting heel, double lozenge lashing. 4. Haft showing high shoulder and plane level surface below for adz butt, toe angle not so acute as in other three hafts.

PLATE XXXVIII. Canoes: *A*, *paopao* dugout canoe; length 15 feet 2 inches, showing typical bow with forward projection and long sloping stern with hauling knob; thick inner flange of upper edge showing on far side; two straight booms; two pairs of connecting pegs inserted into float close together; vertical suspensory lashing passing under float but usually through hole in float; float sharpened, fore end level with bow, aft end cut off square close behind aft connecting pegs (Ofu, Manua). *B*, Model of *soatau* canoe in Bishop Museum; bluff bow, long sloping stern cut off square without hauling knob; three straight booms; two pairs of connecting pegs with each boom separated above by width of boom but more widely diverged below at insertion into float, thus differing from the *paopao* canoe; vertical suspensory attachment with fore and aft booms pass under the float; two longitudinal rods over booms lashed to them above connecting peg lashings; pointed fore end of float level with bow but cut off square close behind aft connecting pegs. *C*, Bonito canoe (*va'a alo*) in Bishop Museum; length 24 feet 6 inches; made of planks sewn together with sennit braid on inside of hull through raised flanges; typical bow and long sloping stern ending in back projection from upper surface; two straight booms connected with float and short middle boom; two pairs connecting pegs with fore and aft booms inserted close together in float; vertical suspensory attachments passing under float; decorated with mesial row of *ovulum* shells on bow and stern covers; stern cover with raised fishing rod post; bamboo bonito rod resting on forked support attached to fore boom and on aft boom; pointed fore end of float level with bow and aft end cut off close behind aft connecting pegs (Tau, Manua).

PLATE XXXIX. *A*, Section of hold of bonito canoe (Pl. XXXVIII, *C*) near aft boom showing connecting flanges with sennit lashings on either side of keel and also between lower and second tier; end join between two pieces of lower tier; strengthening ribs in a lower tier section to right of boom; wide gunwales with single lozenge lashing over the aft boom; *pu'enga* handhold between left gunwale and aft boom. *B*, Bow section of above canoe; showing bow cover with mesial line of *ovulum* shells attached to raised stands; fore boom with gunwale lashings and lashings to inner and outer pairs of connecting pegs which are inserted into the float close together; vertical suspensory attachment passing under float; short middle boom; some lashings between gunwale and side piece showing externally; gunwale with wide upper surface and external raised rim.

PLATE XL. *A*, Model double canoe with matting sail, deck house and upper platform, also mast with *tomotomo* upper end; left view showing smaller dugout corresponding to float, the left end of which is obscured by the typical bow of the right canoe. *B*, Paddles: 1, *paopao* paddle with obtuse outer angles of the blade 8.75 inches wide; blade length 21 inches, total length 34 inches; 2, side view of bonito canoe paddle, showing thin edge of the blade, total length 38 inches; 3, bonito canoe paddle, front view, showing raised ridge running down from handle to blade; width of blade 8.25 inches, total length 37 inches. *C*, Bailers: 1, bonito canoe bailer (no handle) 9.2 inches long, 4.6 inches wide, and 2.7 inches deep; 2, bailers of large canoes with mesial handle, 12 inches long, 6 inches wide, and 4 inches deep. *D*, Sinkers and anchors: 1, shark bait sinkers (*ma'afa'amalie*) with hole drilled right through, groove extending from hole and over end of stone, weight 29 pounds; used to anchor bait with set net for sharks outside reef; 2, shark net anchor (*taula*) with large hole near grooved end; weight 30 pounds; used to anchor shark net set outside reef (Tau); 3, stone weighing 2 pounds with hole drilled through near end, used with others as anchor for small *paopao* canoe.

PLATE XLI. *A*, 1, Sea eel snare (*sele pusi*); sennit braid tied to notch around end of stick and slip noose formed; 2, small stone tied with sennit, used as net sinkers. *B*,

(C.336), Side view of squid lure (*pule ta'i fe'e*) made of two plates of *Cypraea tigris* fitted and lashed over stone shaped like spinning top; stone of dark basalt, 85 mm. long and 49 by 40 mm. diameter at base; *tuasivi* rod of coconut root with coconut leaflet strips attached; line slipped under mesial lashing cord and end knotted; cone-shaped wooden float at proximal end of line to mark site when lure is dropped with too large a squid; lure supposed to represent a rat (Leone, Tutuila). *C* (C. 649), Float for shark bait (*uto malie*) made of breadfruit wood; length 15 inches; wide end, 4.25 inches wide, 4.75 inches thick, anterior projection 1 inch wide; sennit braid down mesial line looped around peg at back; coil of sennit at narrow end for tying bait on to mesial cord and around side grooves; line attached to loop at narrow end. *D,* Coconut fibre receptacle for palolo (*'a'a*); sheet of natural material (*lau'a'a*) folded and tied at ends with strip of bark. *E,* Shark bait of bonito heads (*pa'o'o*); part of head with dried opercula used as bait lure tied to float or separately; maintains strong odor for some time. *F,* Many-pointed fish spear (*tao fuifui*); handle of light wood 8 feet 6 inches long; 33 points of hard wood lashed in spiral arrangement with sennit braid. *G,* Coconut leaf fish sweep (*lauloa*); split coconut leaf wound spirally around a length of vine (*fue vai*) and used in driving fish into a set net (Fangamalo, Savaii).

Plate XLII. *A,* Whitebait scoop (*fonoti*); formed of coconut sennit braid with a netting knot, made like a satchel but with one end not closed, and wooden handles attached to two upper edges; length 11 inches, depth 7 to 8 inches, handles 21 inches long; handles held at closed end and opened out like scissors; used for scooping up fry (*in-gana*) when they come up river in shoals (Ngataivai, Savaii). *B,* Small trap (*fanga fa'atau tu'u'u*) made with single-pair twine from *'ie'ie* aerial roots; black stone within used as decoy for *tu'u'u* fish; manipulated trap used by women who place hand over opening after fish enters (Fangamalo, Savaii). *C,* Fish trap (*fanga i'a*) of lobster pot type made of *'ie'ie* root with single-pair twine; self-acting funnel entrance (Leone, Tutuila). *D,* Fish trap (*fanga i'a*) being made by Fepulea'i Ripley, Leone; the funnel and the *malae* concavity leading to funnel are just completed and trap is being bent round to form sides. *E, Fanga i'a* trap (*D*) completed with thick rim around lower *muli* opening; the funnel is also seen. *F,* Bottom ends of traps: 1. *fanga i'a* trap showing the *muli* opening at the bottom end; 2, crayfish pot (*fanga ula*) showing closed lower end; 3, *fanga fa'atau tu'u'u* showing small size and bottom where twining commenced over crossed warp; 4, *'enu* trap made of *'ie'ie* root arranged in two layers of warps with spiral weft of *'ie'ie* root between lashed with sennit braid; view showing bottom in centre of which the lashing commenced (Tutuila).

Plate XLIII. *A,* Crayfish pot (*fanga ula*) with closed lower end; warp and wefts of more than one element of *'ie'ie* root; very flat around outer circumference of funnel entrance (Leone, Tutuila); *B, fanga'ofe* double entrance trap made of bamboo with different lashing to *'enu* traps; length 41 inches, diameter at middle 18 inches, diameter at ends 11 inches (Fasitoouta, Upolu); *C,* sea eel trap (*fanga pusi*) made of rods lashed together to form flat box; opening enters into funnel of strips of wood and self-acting mechanism made of *lau'a'a* coconut natural fabric; length 22 inches, width 13 inches, depth 5 inches (Fasitoouta, Upolu); *D, 'enu* trap of lobster pot type, showing upper funnel opening; maximum diameter 25 inches and depth 18 inches; funnel 12 inches deep and 6 inches in diameter at inner opening (Tutuila); *E, 'enu* trap of domed cylinder type set on side; length 28 inches, depth at rim 19 inches; same stroke technique as the lobster pot type (Vaiusu, Upolu).

Plate XLIV. *A, Fangauli* fish trap made of thick *tuafanga* vine with single-pair twine; double entrance trap showing the *mata* opening with finish around rim; diameter at middle 2 feet 3 inches, diameter *mata* opening 12 inches (Sapapalii, Savaii). *B, Fangauli* fish trap (*A*) showing *muli* opening with the *afe* turn; diameter of opening 10 by 13 inches.

Plate XLV. *A,* Netting implements: 1, netting needle (*si'a*) (Savaii); 2, mesh gage (*afa*) with newly made meshes upon it; 3, net made of *fau songa* native cord. *B,*

Se'i hand net; handle sticks 30 inches in length, net 23 inches by 20 inches (Vaiala, Upolu). *C,* Turtle net of sennit braid (*'upenga 'afa*) with large floats and stone sinkers; meshes 1 foot; depth of net 24 feet; kept wound up on sticks in two separate parts, each about 34 fathoms long (Ngataivai, Savaii). *D,* Rather narrow casting net (*'upenga tili*) with peg floats and stone sinkers, floats 3.5 inches long and 0.4 inch in diameter; sinkers of small natural waterworn stones (Tutuila).

PLATE XLVI. *A,* Shrimp net (*'u'uti*): width at bottom 5.5 feet; sinkers of shells (*Cypraea mauritiana*), Apia, Upolu. *B, Alangamea* hand net for catching mullet as they leap over seine net; side poles 9 feet in length, width of net at top 9 feet 9 inches; net opened out for use with right pole in fork of crossbar. Note *muli* bag part of net near handle (M'oata'a, Upolu).

PLATE XLVII. *A,* Eel hooks (*matau tuna*) made of two pieces of hard wood lashed together, fixed with *fau* bast and plaited into three-ply braid (Malaeloa, Tutuila). *B,* Fish hooks: 1 and 2, bonito (*pa 'atu*) with length of *fau songa* cord attached, turtle shell point, and fibre hackle; 3, bonito hook with wider turtle shell point; 4 bonito hook with pearl shell point; 5, bonito hook showing front view; 6 and 7, *pa ala* hooks with round shanks, feather hackles, turtle shell points, and thinner *fau songa* cords of hook attached to lines of 5-ply sennit braid; characteristic coiling; 8, *pa ala* hook with flat shell shank; 9, small *pa seuseu* hook with shell shank and metal fishhook for point; also three-ply cord of *fau songa*; 10, two small *pa seuseu* with metal hook; 11, very large shank said to be *pa tangi* made of a whale's tooth and inlaid on back with pearl shell; length 190 mm., greatest width at pointed end 31 mm., width lower end 18 mm., greatest thickness 24 mm.; hole through near pointed end; lower end nicked on curved sides for lashing the point; obtained at Leone but may be Tongan; 12, Tongan hook, with barbed turtle shell point and five-ply braid line of *fau songa*; the shank is of whale's tooth shaped and inlaid on back with pearl shell in exactly the same way as the shank (11).

PLATE XLVIII. *A,* Rat trap (*mailei 'iole*): bamboo cylinder with two wooden cross pieces; the curved spring piece stayed with vertical and oblique pieces; trap set with sennit loop showing in entrance; over elaboration with sennit bindings (Tau, Manua). *B,* Hooking appliance for flying fox: branches of *angaoso* creeper with curved thorns tied to long handle in 30-inch lengths; the flying fox is hooked over the wings when coming to feed on fruit trees (Tau, Manua). *C,* Bow and arrows: 1, bow (*aufana*) made of *fisoa* wood 53 inches long and 0.8 inches in diameter; bowstring of five-ply sennit braid which is also wound spirally around bow for ornamentation; grooves cut around ends of bow to take string (Aopo, Savaii); 2, single-pointed long arrow (*u matatasi*); point of *pau* wood 6 inches protruding and 5 inches bound to groove in shaft; free part square in section with edges nicked; shaft of cane (*u*) 4 feet long and 0.3 inch in diameter, not feathered; 3, two-pointed arrow (*u matalua*); material same as (2), but shaft not grooved for points which are laid on either side of shaft end and lashed with sennit braid; 4, three-pointed arrow (*u matatolu*); same material but shorter points; third point concealed in plate behind lower point; 5, single-pointed short arrow (*u ta'afale*); for shooting at bird in awkward position to side or behind fowling house.

PLATE XLIX. *A,* Pigeon net (*'upenga seu lupe*): handle 5 feet 2.5 inches long, length with net 15 feet; net 6 inches wide at top, 27 inches in middle, and 7 inches at handle; bag near top end 30 inches deep (Aopo, Savaii). *B,* Jack straw sticks (*fiti*); light sticks 18 inches long and thick as a lead pencil; no definite number; rolled mat with two uprights and sticks laid in bundle between; the game is to flick off the greatest number singly without missing a stroke. *C,* Coconut shell discs (*au lafo*): Two sets of five coconut shell discs of various sizes, ranging from diameter of 2.5 inches to 5 inches, used in pitching game like quoits; the large discs have been cracked and repaired with lashings through holes bored on either side of crack; the disks have been carved and lime set in. Plaited pandanus mat used in the game.

PLATE L. *A,* Musical instruments: 1, small wooden gong (*pate*); wood elliptical in cross section, hollowed out through longitudinal narrow opening to within few inches of ends; ends hollowed out for short distance; introduced from Tahiti; 2, small wooden gong with one end produced to form a handle; beaten with one stick which is beside it; 3, short length of bamboo (*'ofe*) with one end split; the other end is thumped on the ground in beating time to dances; 4, shell trumpet (*pu faofao*) *Cynatium tritonis* with hole bored through third whorl; 5, shell trumpet (*pu foafoa*) *Cassis cornuta* with apical whorls cut off to form trumpet. *B,* Mature coconuts (*popo*) stacked against vertical stakes to which they are fastened to await convenient time for making copra. *C,* Wooden gong (*lali*); two wooden gongs of hollowed-out logs, beaten with two sticks to call meetings together; also used in pairs which are set to different notes (Saleaula, Savaii).

PLATE LI. Samoan Clubs: 1 (2114), round billet club (*povai*): length 36 inches; rounded distal end; distal diameter 2.75 inches, handle diameter 1.5 inches; proximal end flared, low triangular lug; bands of carving; used by King Malietoa in war with Tamasese; 2 (B.2900), round billet (*povai*); length 34.5 inches, distal diameter 2.9 inches, handle diameter 1.8 inches; rounded distal end, flared handle with pentagonal lug, wide bands of carving; 3 (2118), four-sided billet (*povai*); length 32 inches, distal diameters 1.9 and 2 inches, handle diameter 1.5 inches; distal blunt point, handle flared, deep pentagonal lug; bands of carving inset with lime; 4 (5699), bilateral-toothed club (*fa'alaufa'i*); length 34.25 inches, blade length 15.75 inches, blade width, proximal 2.7 inches, distal 4.5 inches; 17 pairs of teeth; the teeth are bevelled at the sides and back on to the blade; diameter of handle 1.3 inches, flare 2.0 and 2.1 inches; triangular lug (varnished model); 5 (C.700), dancing club (*anave*); length 45 inches, blade length 15.5 inches, width 4 inches; five pairs bilateral transverse spikes; handle diameter 1.1 inches; no flare, lug, or hole; clubs are used in dances; 6 (B.4022), foreign club; length 51 inches; maximum width of blade 2.9 inches, blade length 23 inches; two raised bands across blade with serrated edges; handle diameter 1.4 inches; no flaring, no lug; transverse hole bored through handle 2.5 inches from end; wood heavy, labelled Samoa, but probably foreign; figured for comparison with dancing clubs; 7, coconut stalk club (*uatongi*); length 42.5 inches, head width 4.2 inches, thickness middle line 2 inches; end concave transversely; distal band of nine transverse raised ridges followed by seven, four, and three raised transverse ridges; handle diameter 1.3 inches; flared, no lug, but oblique hole for supporting cord through flared rim (Amouli, Tutuila); 8 (2101), unilateral-toothed and hook club (*Nifo'oti*); length 40 inches, greatest width 9.5 inches, blade length 22.5 inches, greatest thickness 3.2 inches, depth of hook 1.75 inches, handle diamater 2 inches; proximal end not flared; no lug; carved in wide bands; 9 (7879), bilateral-toothed club (*fa'alaufa'i*); length 49 inches, blade length 17.5 inches, blade width proximal 3.8 inches, distal 4.3 inches; nine pairs of teeth without counting head and shoulder points; handle diameter 1.3, flared to 1.7 and 1.9 inches; pentagonal lug; handle decorated with bands formed of three turns of sennit braid—originally four bands. The club is a full-sized weapon.

PLATE LII. *A,* Clubs: 1 (2120), Paddle club model; length 35 inches; maximum width of blade 3.75 inches, width of rib 3.7 inches, length of blade 16 inches; handle flared; triangular lug; leaf form of blade; 2 (2119), paddle club; length 39.75 inches, blade width 3.2 inches, rib width 4.4 inches, blade length 13.5 inches, handle diameter 1.3 inches; not flared and no lug or hole; the club is completely carved including handle and its proximal end surface; the blade after sloping in from the cross rib is straight edged; though labelled Samoa the club is probably from Tonga; 3 (2109), intermediate form club; length 24.5 inches; resembling a coconut stalk club with an ear-shaped end on the right side; slightly flared handle; no lug; well made one-handed club; 4 (B.2895), ear-shaped club (*fa'alautalinga*); length 24 inches; head length 3.4 inches, width 6.3 inches, maximum thickness 1.8 inches; handle elliptical cross section; diameters 1.2 and 1.4 inches; handle flared and with curved lug; carved on head and shaft; well made one-handed club; 5, ear-shaped club (B.2898) length 26.5 inches; head length 64 inches, width

10.75 inches, maximum thickness 1.8 inches, handle diameters 1.5 and 1.6 inches; well flared, curved lug; head and shaft carved; well-made club used by Malietoa; 6, ear-shaped club (2129) length 22.5 inches; head length 4.4 inches, width 11.75 inches, maximum thickness 2.4 inches; handle diameter 1.5 inches; well-flared; triangular lug; the end curve is flattened and the median longitudinal edges very pronounced; 7 (L.1509), short baton club; length 20 inches; diameter, proximal 1.3 inches, distal 1.7 inches; transverse hole through proximal end for cord, also large transverse hole through distal end; old well-polished specimen; 8 (L.1516), short baton club; length 19.25 inches, diameters, proximal 1.3 inches, distal 2.3 inches, transverse hole through proximal end and projection from end; distal end rounded; the club is wrapped with sennit braid; 9 (L.2132), knobbed throwing club (*'olo*); length 13.5 inches; longitudinal diameter of head 2.4 inches, transverse diameter 2.8 inches; handle diameter 1.3 inches; slightly flared and rounded end; four bands of carving round handle; 10 (6949), mace club (*fa'aaufala*); length 26.5 inches, head length 13 inches, widest head diameter proximal 4.75 inches; handle flared; triangular lug; 11 (2133), short mace club (*fa'aaufala*); length 15.5 inches, head length 6 inches, widest diameter 3.1 inches; handle flared; triangular lug. *B*, Spears: 1, barbs arranged in three longitudinal rows with one compound barb spaced at intervals between the ordinary long slightly curved barbs; 2 (3579), *tala-o-le-lo*; length 72 inches, barbed part 20 inches; simple barbs near point arranged in four longitudinal rows; compound barbs (*tala-o-le-lo*) also in four longitudinal rows; 3 (C.396), spear with barbs on one side (*tao fa'atala lau paongo*, spear barbed like the pandanus leaf); length 67.25 inches; also used as talking chief's staff.

PLATE LIII. *A*, *Tuinga* headdress; 1, *pale fuiono* band worn over the forehead with the headdress. Foundation of cloth with upper row formed of the nuclear whorls of nautilus and lower row of outer portions of post-nuclear whorls; 2, tufts of human hair, one end seized with coconut fibre to form eyes through which cord is threaded; used with *tuinga* headdress. *B*, *Tuinga* headdress set up with *pale fuiono* forehead band, *lave* framework supporting circular mirrors and human hair fluffed out at back and sides; worn by *Fa'apua'a*, the taupou of Tufele at Tau, Manua. Note the whale's teeth necklace and fine mat skirt.

PLATE LIV. *A*, Chief's fly whisk (*fue*) of short lengths of sennit braid lashed to a long handle; handle length 15.5 inches, length of fibre 13 inches, diameter handle proximal end 0.7 inches. *B*, (C.397), Talking chief's fly whisk with longer pieces of three-ply sennit braid in greater numbers lashed to a short thick handle; handle length 14 inches, fibre length 24 inches, diameter handle proximal end 1.6 inches. *C*, Talking chief Timu of Safotu, Savaii, with orator's fly whisk balanced over left shoulder and staff in hand. Note dress of bark cloth with fine mat. *D*, Ornaments: 1, boar's tusk ornament worn around upper arm; 2, whale's teeth necklace (*'ula lei*), teeth ground down to curved pendants from 3.3 to 5.6 inches long; 31 teeth lashed together with cord passed through holes; 3, belt of human hair, 110 strands of three-ply braid, length 39 inches (may be foreign).

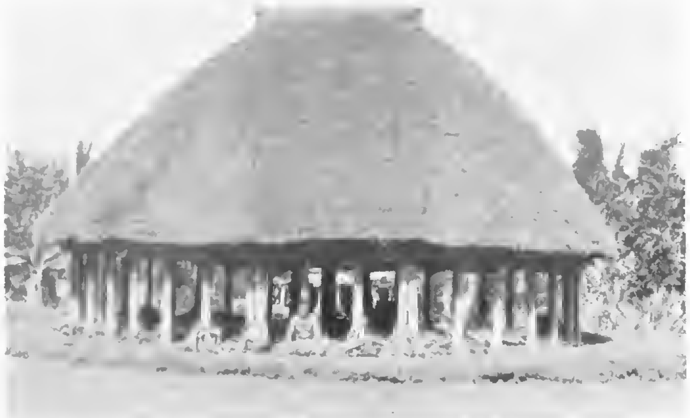
PLATE LV. *A*, Combs: 1 (C.378), *selu tuaniu*, 27 coconut leaflet midribs ranging from 24 to 26 inches in length, bound together by three bands of thin leaflet midrib; uppermost band of plain wrapped work, middle band half wrapped work, and other half of wrapped work followed by wrapped twine; lowest band wrapped work and wrapped twine; two marginal midribs curved in and caught in uppermost band; 2 (2198), *selu*, height 7.2 inches, width at top 0.2 inches, at top of decoration 1.4 inches, bottom of decoration 1.7 inches, across teeth 2.6 inches; composed of 24 pieces dried midrib, two marginal and middle pairs reach top; side pairs closely bound with coconut fibre dyed black; simple lashing at top; lashing band above decoration of wrapped work without wrapped twine; height of decoration 1 inch; binding technique of decoration consists of wrapped work passing around two midribs; rows of clear and red beads threaded on wrapped work; 3 (7118), *selu pau*, cut out of *pau* wood in the solid; height 6.1 inches, width at top of expanded part 1.7 inches, at bottom of carving 2.1 inches; carved with alternating tri-

angles making a zigzag line; 4 (7117), *selu pau,* also cut out of *pau* wood; height 10.75 inches, width at top of side points 1.5 inches, at bottom of carving 2.1 inches, across the ends of 21 teeth 2.5 inches; carving of alternating and single rows of triangles; 5 (B. 2820), *selu,* height 7.2 inches, width at top 0.5 inch, top of decoration 1.1 inches, bottom of decoration 2.0 inches, across lower end of teeth 3.9 inches; composed of 18 pieces of dried coconut leaflet midrib half of which end above decoration; top band of wrapped work and wrapped twine as is also the band above decoration; material is of coconut fibre, decorative bindings of black hair and coconut fibre; depth 1.7 inches; technique (see text); 6 (7120), *selu,* height 7.1 inches, width at top 0.3 inches, top of decoration 1.5 inches, bottom of decoration 1.9 inches, across lower end of teeth 2.3 inches, composed of 18 pieces dried midrib, three pairs reaching top, of which two are extra pieces starting from lower end of decoration; three upper pairs lashed by spiral bindings of coconut fibre with beads threaded on here and there; top end central lashing; in above decoration one lashing is of wrapped work and wrapped twine; height of decoration 1.4 inches; alternate rows of white and blue beads; for technique see text; 7 (C.724), *selu tuaniu,* width across four triangles 6 inches; height of triangles 1.2 inches; 8 (2196), *selu,* height 12.5 inches, width at top 0.2 inches, bottom of decoration 2.2 inches, across teeth 3.2 inches; composed of 27 dried midribs of which the three middle ones reach the top; at 5.6 inches from the top, the midribs are thinned out by cutting off two on either side of the middle three, leaving four standing, cutting out the next pair on either side, and leaving the four marginal midribs on either side standing; the eight midribs left standing on either side of the middle three are dealt with in four pairs by bending them inwards and outwards at angles so as to form open lozenges; the innermost pairs are lashed to the middle three at the three points where they touch and are cut off above the last lashing which is 1.1 inches from the top; the next pair are similarly zigzagged and lashed to the inner pair at the two points where they touch and are cut off 1.1 inches below the upper ends of the inner pair; the third pairs reach to 1 inch below the upper ends of the previous pairs where they are cut off after being lashed to them; the last marginal pairs run direct to the outer angles formed by the preceding pairs where they are lashed and cut off; the successive cutting off of the midribs gives a triangular effect; the midribs are closely wrapped with coconut fibre dyed black and with beads threaded on; below the cut off ends of the internal pairs the 27 midribs are bound together with wrapped work without the wrapped twine in four bands close together; vertical panels of spaced bead work follow for a depth of 2.1 inches, followed by close decoration 1 inch in depth. *B,* Fans (*ili*): 1, *ili aulamalama* dry coconut leaf with natural leaf midrib as handle; base of fan distal; check plait technique; 2, *ili tea* of young bleached coconut leaf; base of fan proximal, distal end bifurcated; twilled-two technique; fan lashed to wooden handle with hair braid; 3, *ili tea* fan in check with base proximal and openings left for ornamentation; lashed to wooden handle with sennit braid; 4, pandanus leaf fan plaited in check over split bamboo handle; 5 (C.780), *ili pau* made of *pau* wood cut out with steel implement; length of fan 10 inches, handle 9.25 inches, width of fan 8.25 inches.

Plate LVI. *A,* Tattooing process: artist holds tattooing instrument in left hand and mallet in right; patient shows scabbing on back from previous stage of tattooing; assistant holds cloth. *B,* Tattooing implements: 1, coconut mortar with wooden pestle for preparing pigment; 2, medium-sized tattooing comb (*au songi aso tetele*); 3, palette of green *talo* leaf tied over half coconut shell; 4, cylindrical instrument container (*tunuma*) made of pandanus wood; 5, tattooing mallet (*sausau*) made of coconut leaf midrib, with handle on the left cut away for grip; 6, large *au tapulu* instrument for filling in the dark areas; 7, two small *au fa'atala* instruments for making dotted lines; 8, old bark cloth used as sponges after dipping in water.


A

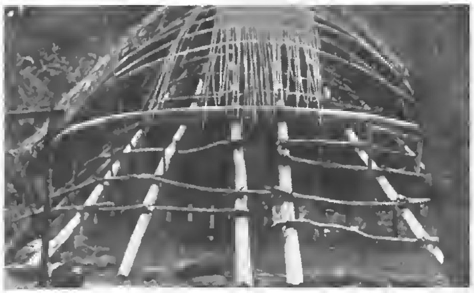

B


C

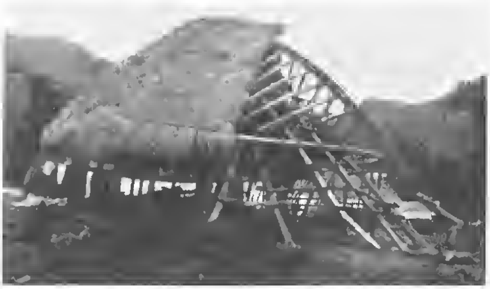

D

HOUSES

A

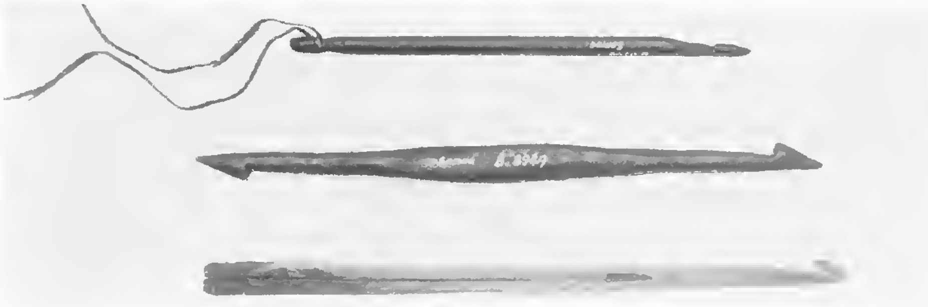


B



C

HOUSE INTERIOR AND CONSTRUCTION



1
2
3

A

1
2

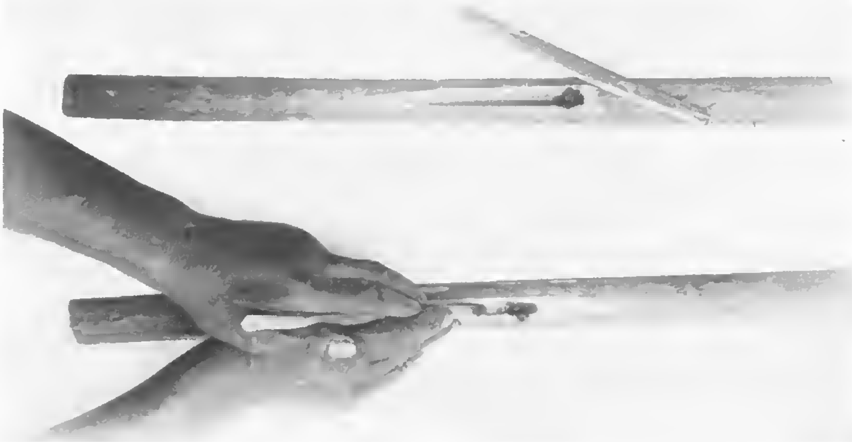
B

C

1
2
3

D

THATCHING NEEDLES, BROOMS, THATCHING PADDLES, AND BAMBOO PILLOWS



A

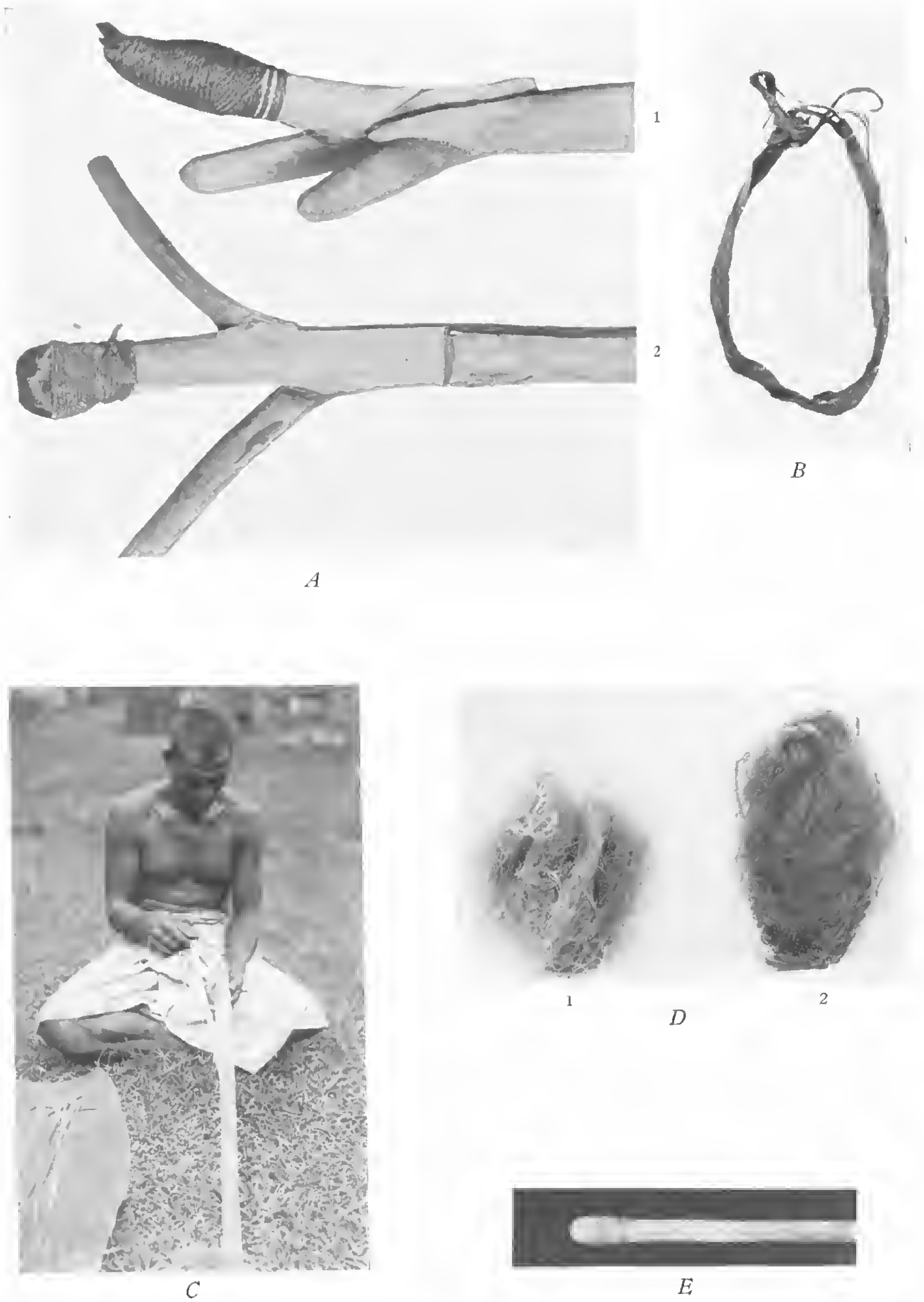
B

C

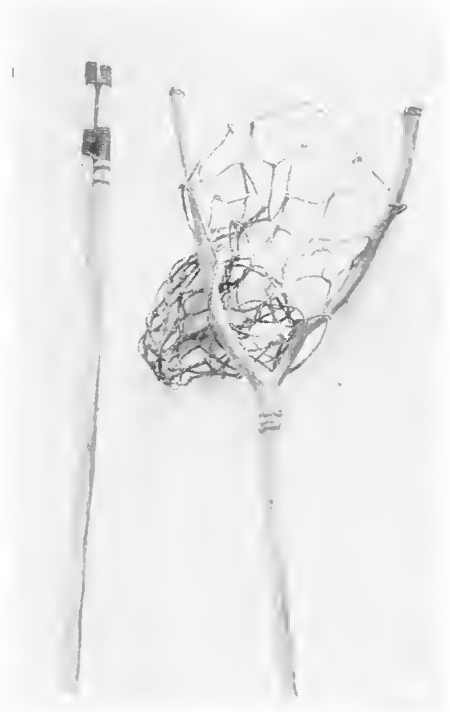
D

E

FIREMAKING APPLIANCE, TONGS, SCRAPERS, AND WATER BOTTLES.



COCONUT GRATERS, CLIMBING BANDAGE, AND WRINGERS.



1 2

A

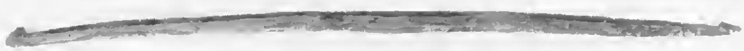
B

C

BREADFRUIT PICKERS AND POUNDERS.

1 2 3 4

A

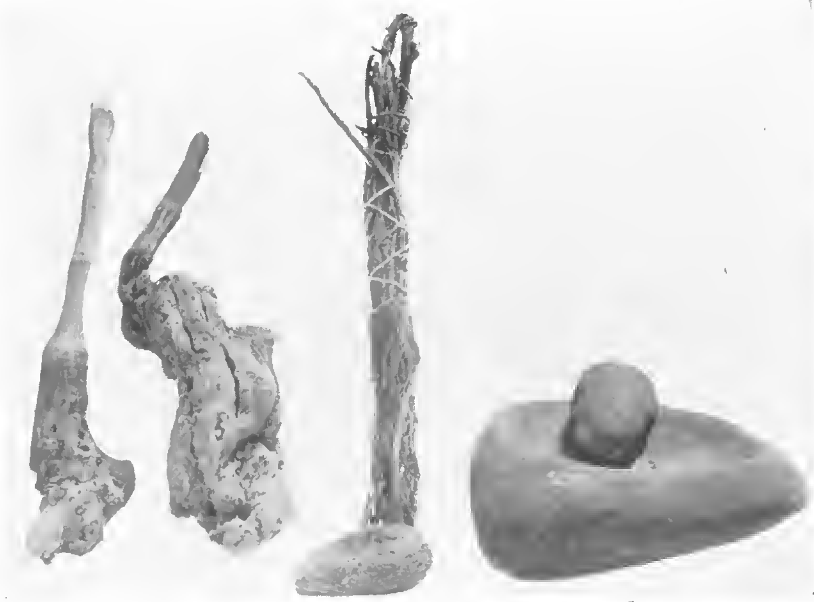


B

C

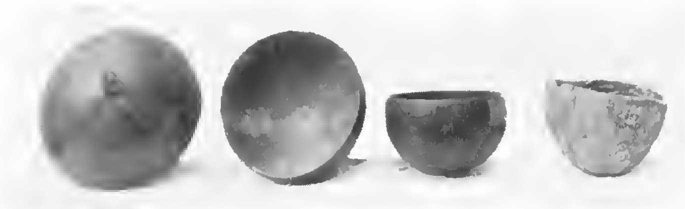
D

BREADFRUIT SPLITTERS, CARRYING POLES, AND POUNDERS, AND BREADFRUIT SCRAPING PROCESS.



1 2 4 5

A



1 2 3 4

B

1 2

C

KAVA ROOT AND UTENSILS

A

B

C

D

ROUND KAVA BOWLS.

A

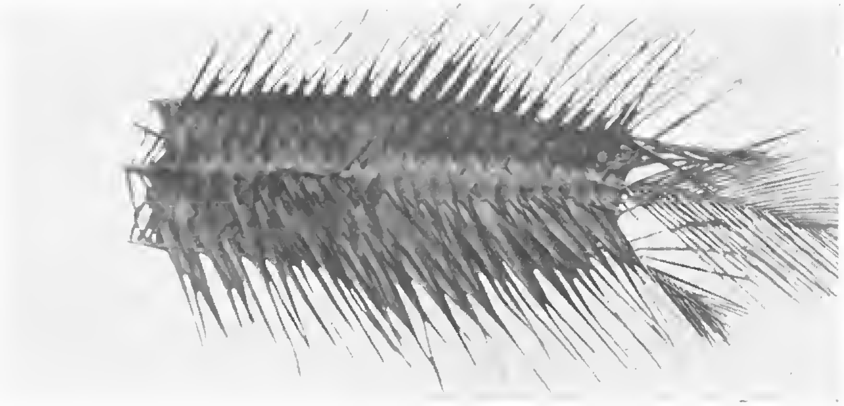
B

C

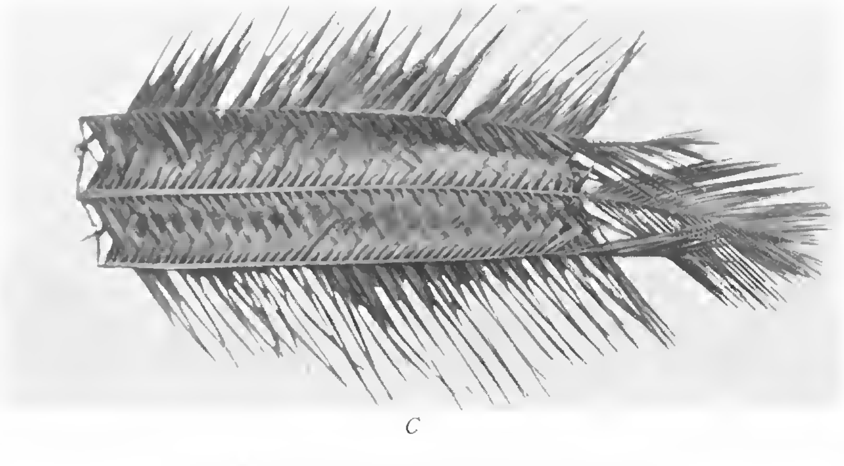
D

ELLIPTICAL AND ROUND KAVA BOWLS AND MASOA BOWL.

A

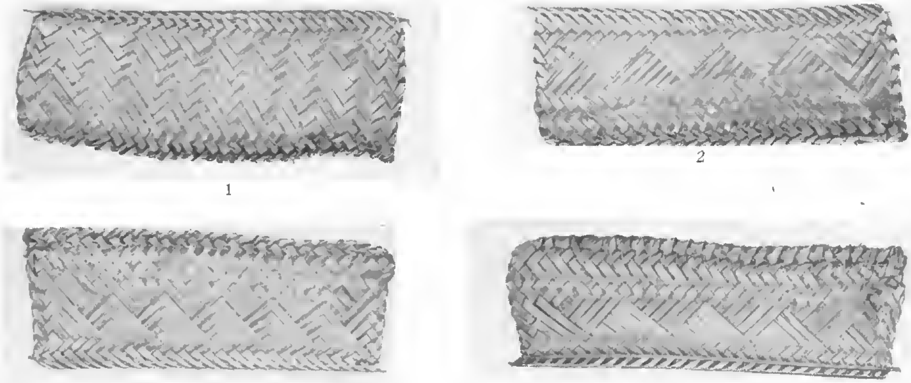


B



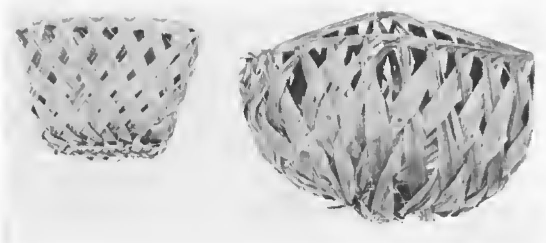
C

COCONUT LEAF, ROOF AND RIDGE SHEETS.



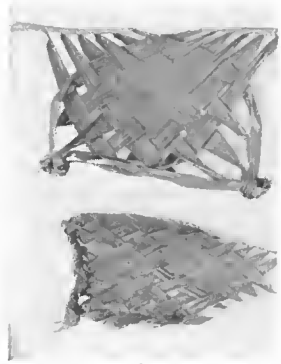
1 2 3 4

A



1 2

B

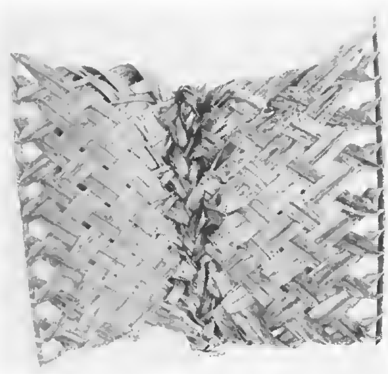


1 2

C

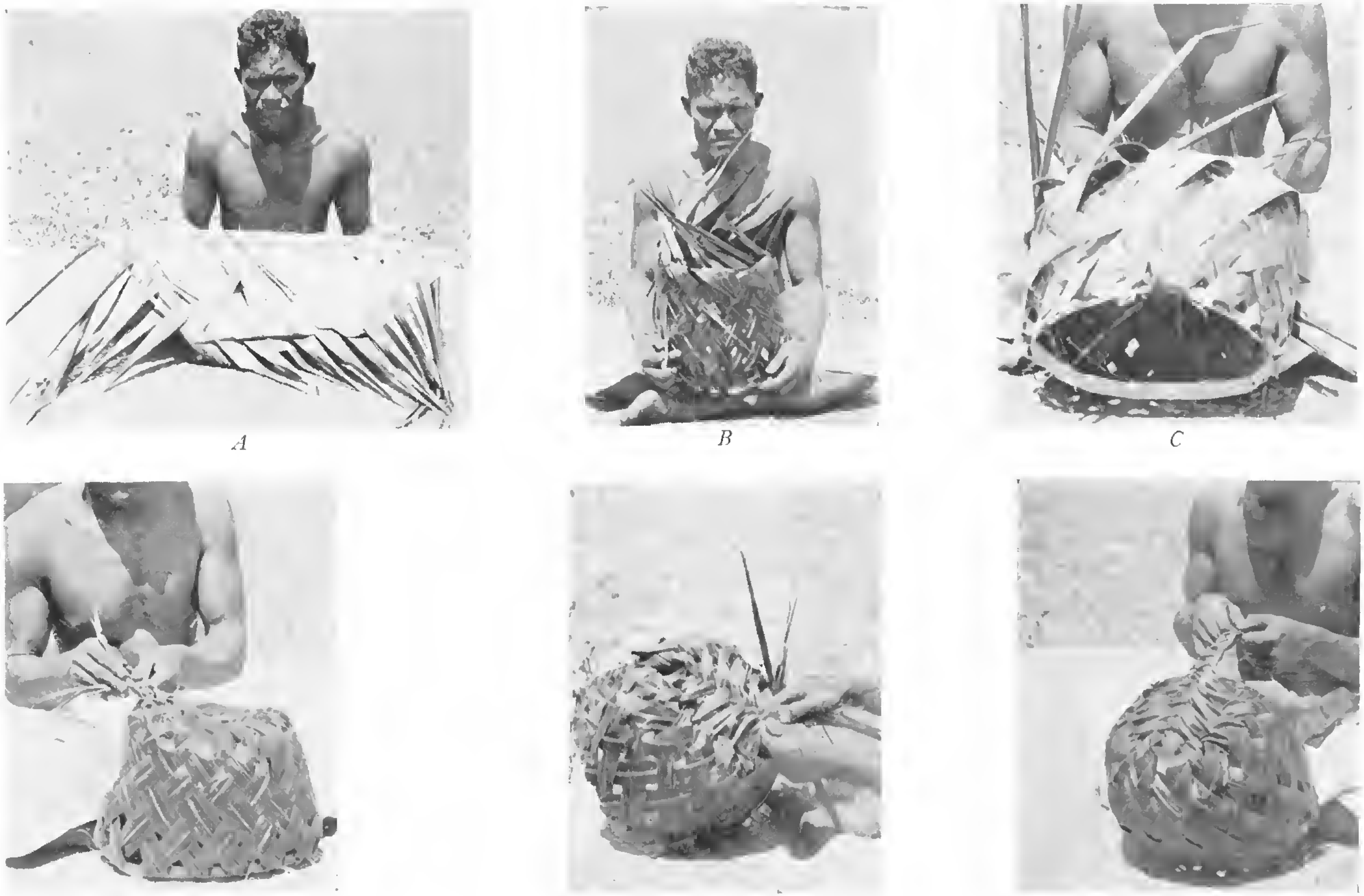
1 2

D



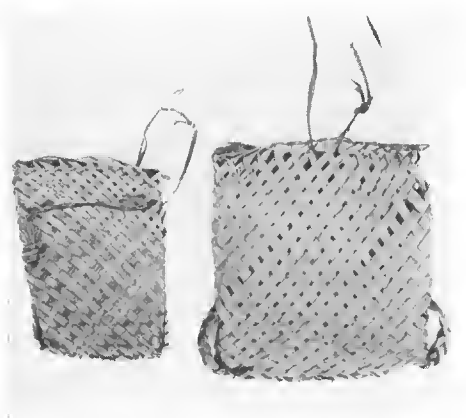
E

PLAITED COCONUT LEAF ARTICLES

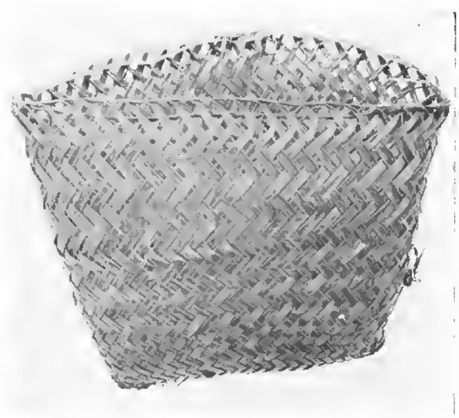


A B C D E F

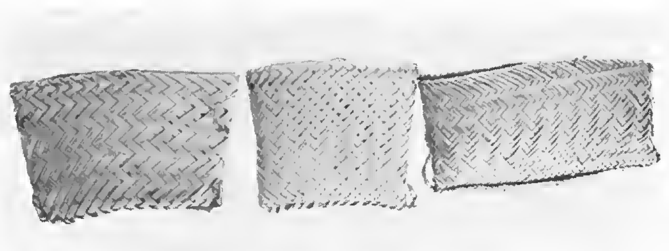
PLAITING COCONUT LEAF BASKETS.



1 *A* 2

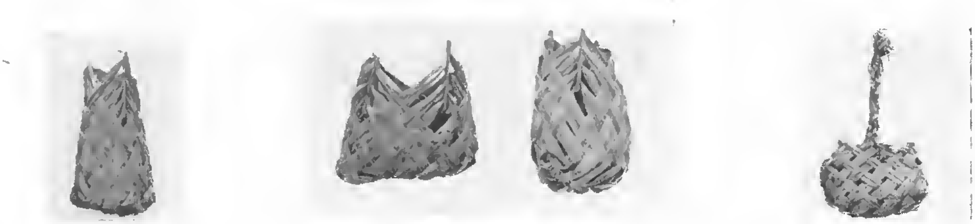


B



1 2 3

C



1 2 3 4

D

TYPES OF COCONUT LEAF BASKETS.

1 2

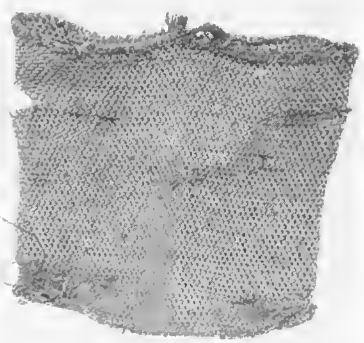
A

B

ROUND COCONUT LEAF BASKETS.

1 2

A



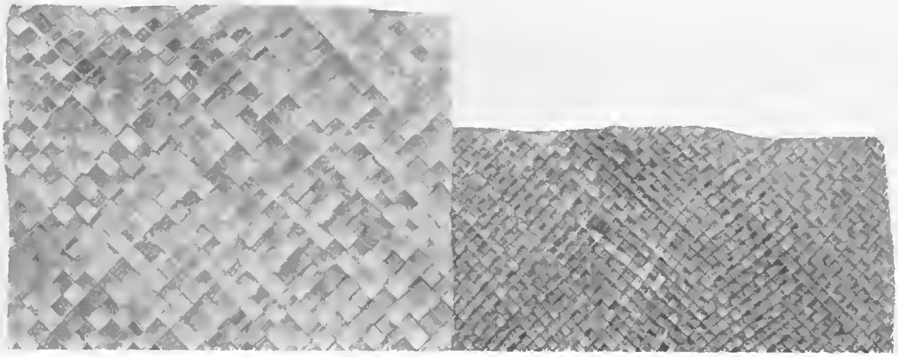
B

C

D

E

TYPES OF BASKETS AND COCONUT LEAF FLOOR MAT.

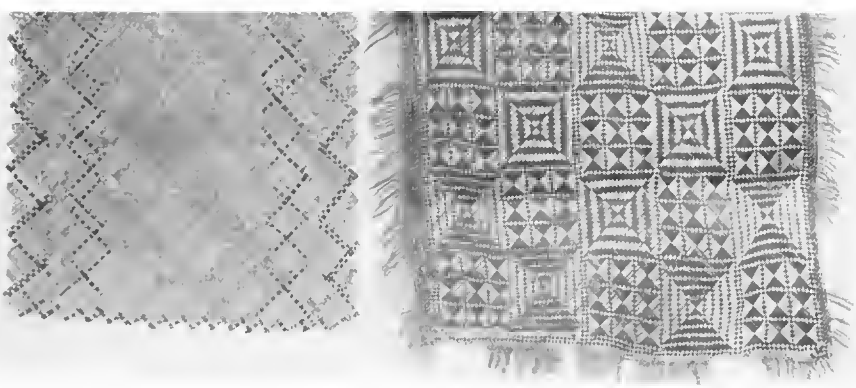


1 2

A

1 2 3

B



1 2

C

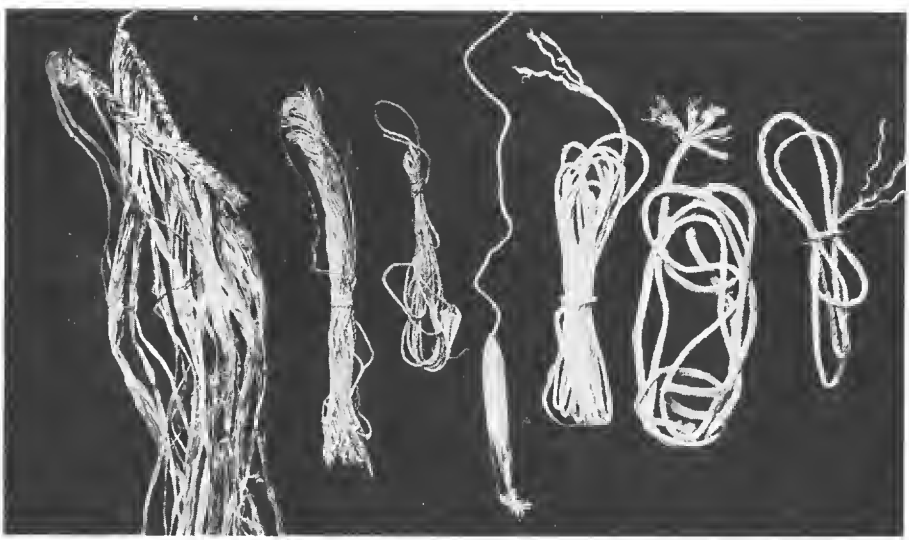
PANDANUS LEAF MATS.

1 2 3 4

A

1 2 3 4 5 6

B



1 2 3 4 5 6 7

C

PLAITING SAMPLERS, CORDAGE MATERIAL, AND CORDS.

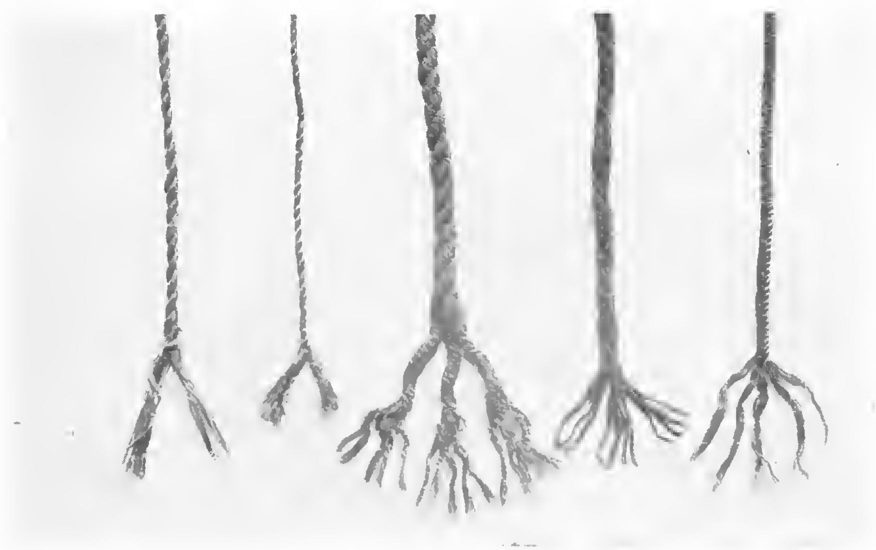
1 2 3

A

1 2 3

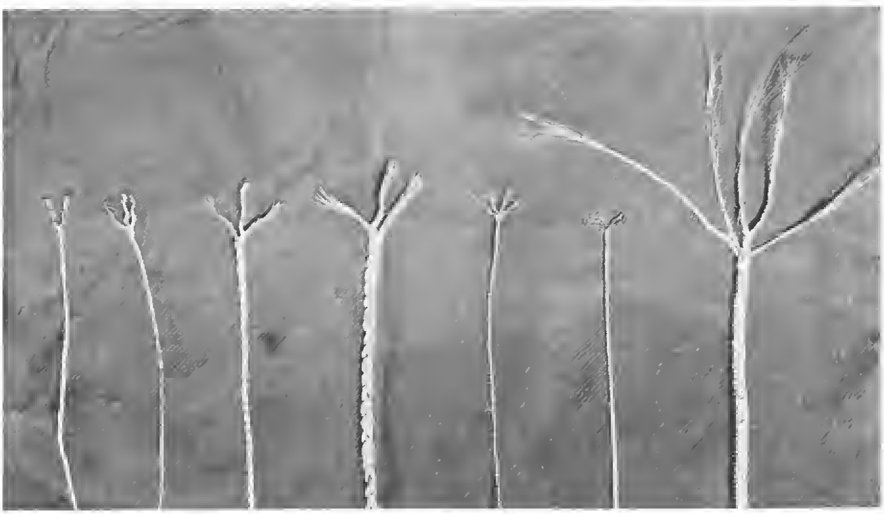
B

SENNIT FIBRE AND BRAID.



1 2 3 4 5

A



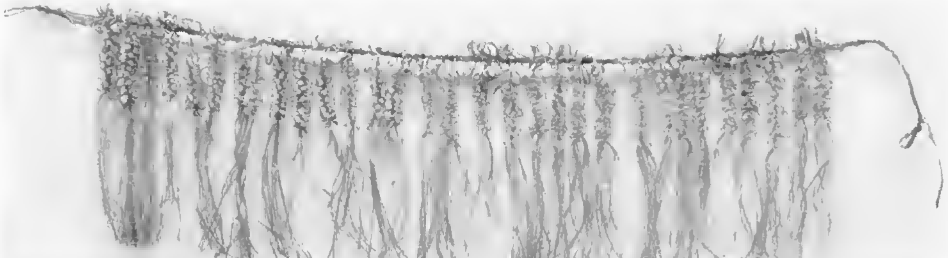
1 2 3 4 5 6 7

B

ROPES AND CORDS.

A

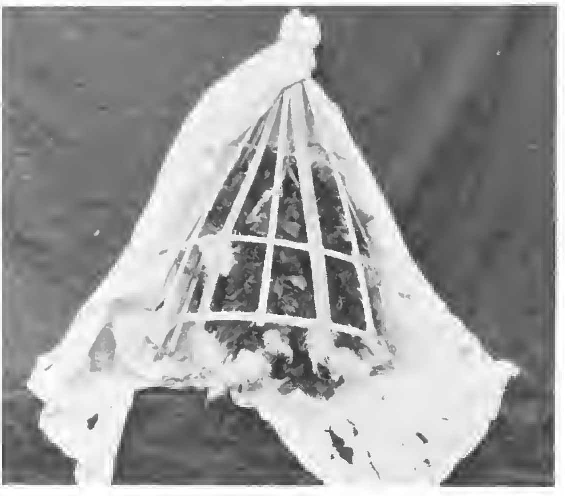
B



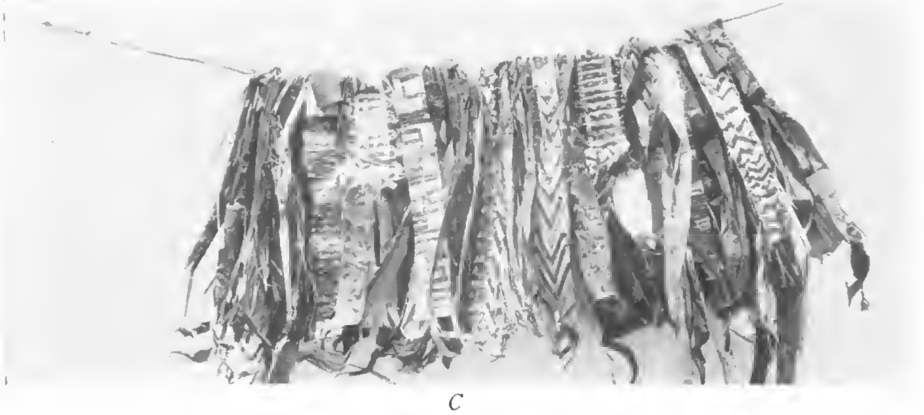
C

HANGING-STRIP KILTS.

A



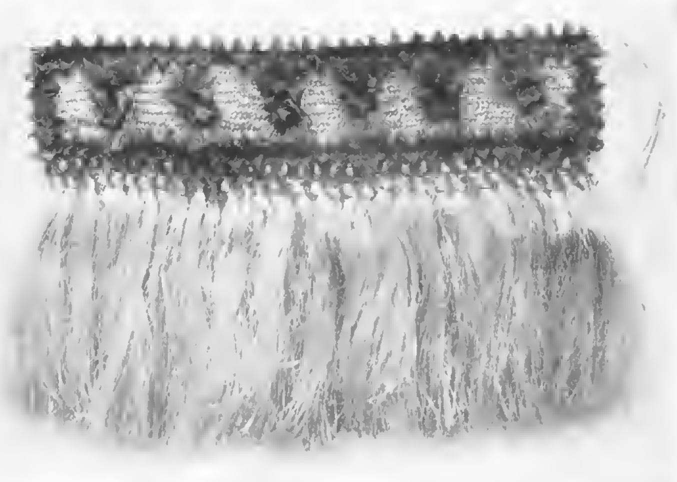
B



C

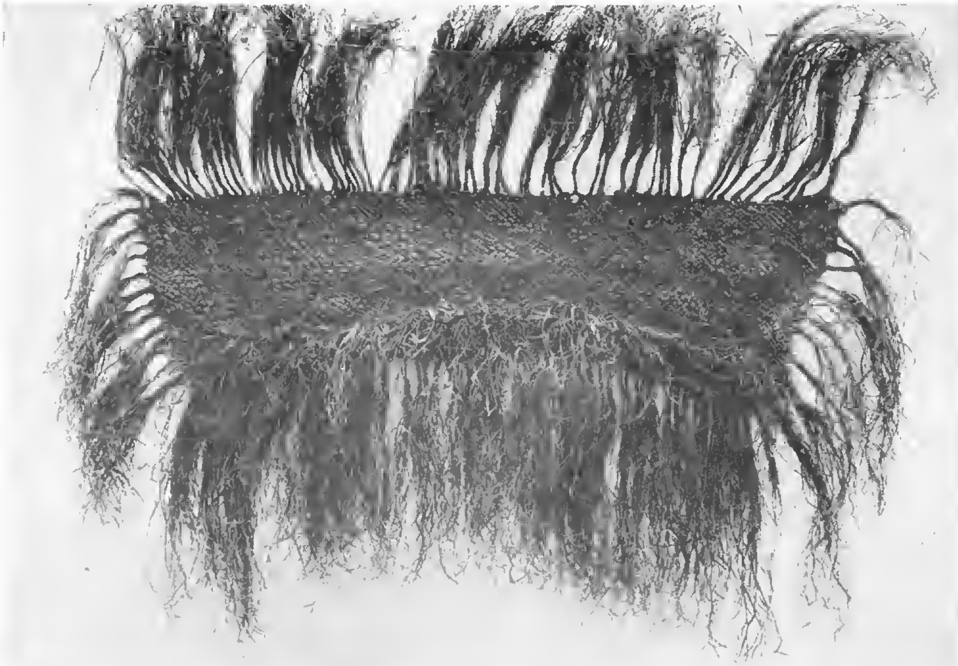
FEATHER AND PANDANUS KILTS.

A



B

PLAITED KILTS.



A

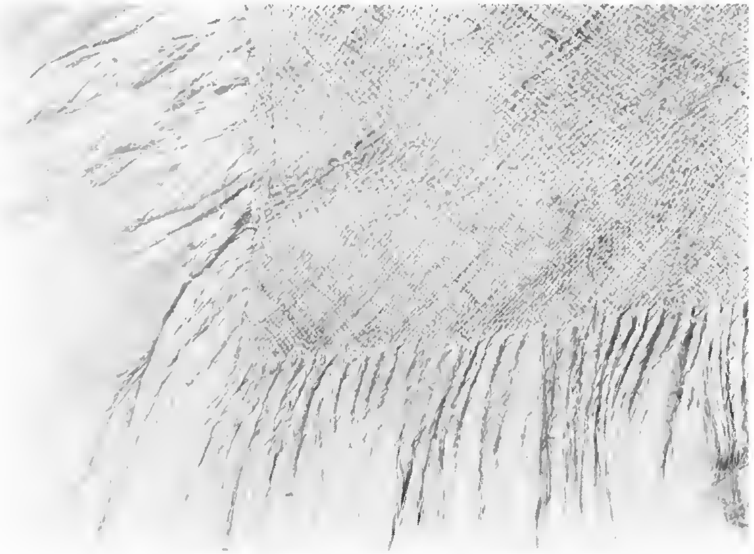
B

TEXTILE KILTS.

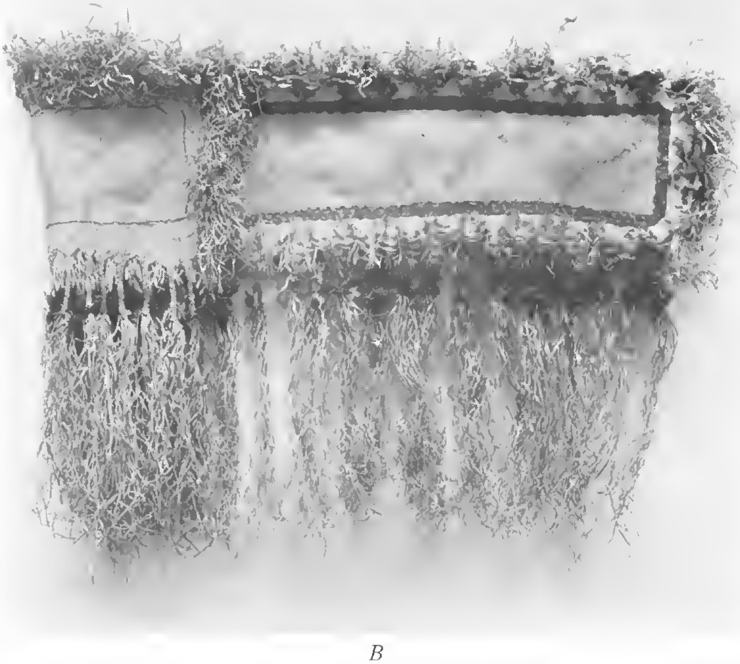
A

B

TEXTILE KILTS.

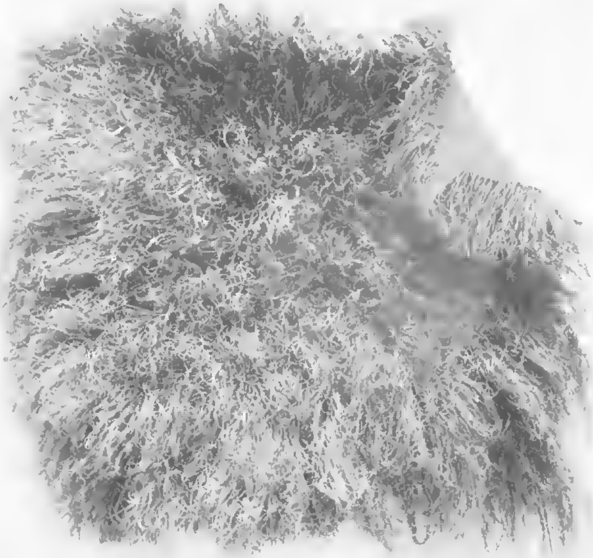


A



B

TEXTILE AND FINE MAT KILTS.

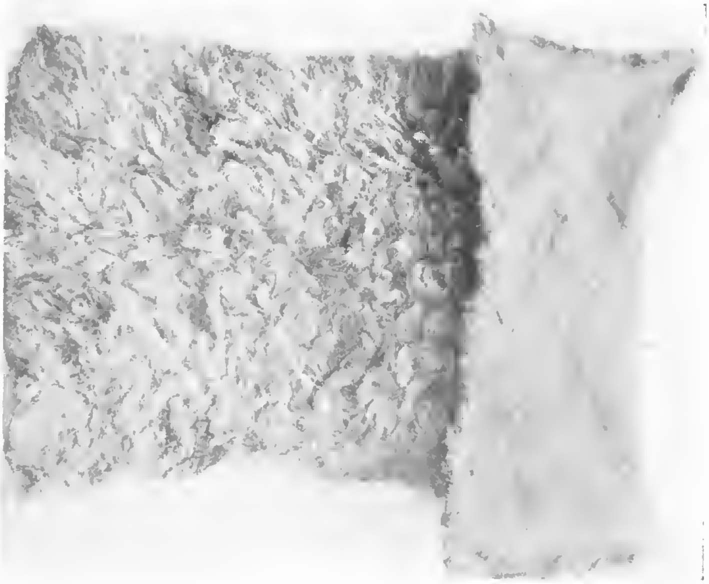


A

B

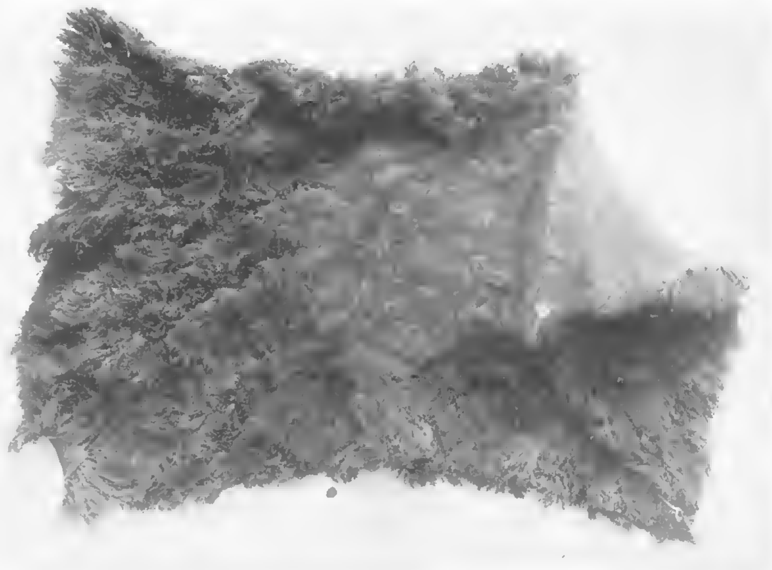
SHAGGY GARMENTS.

A



B

SHAGGY GARMENTS.



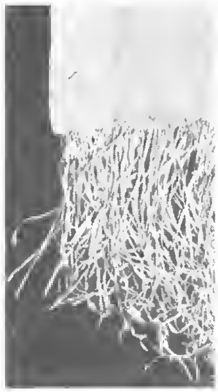
A

B

SHAGGY GARMENT AND KILT.

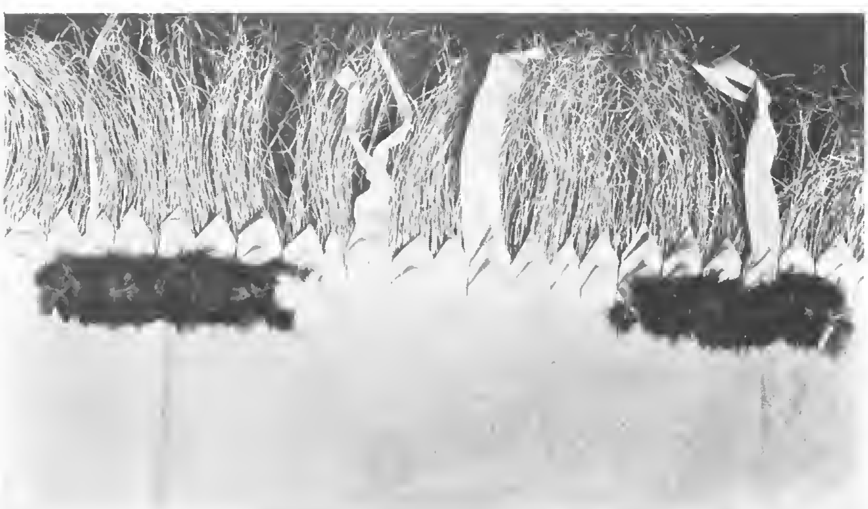
1 2 3

A



B

C



D

FINE MATS.

1 2 3 4 5 6 7 8 9

A

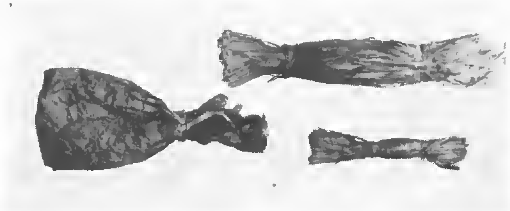
1 2 3 4 5

B

C

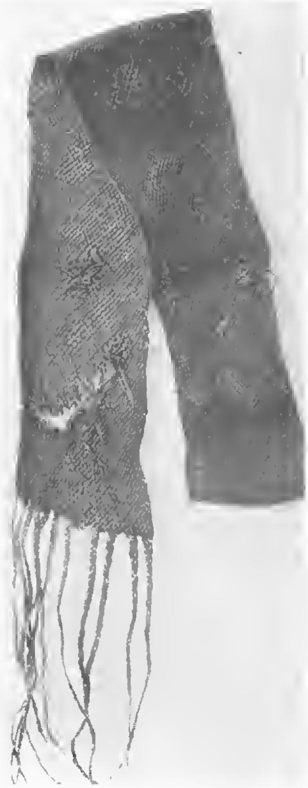
D

IMPLEMENTS AND PROCESSES OF BARK CLOTH MAKING.

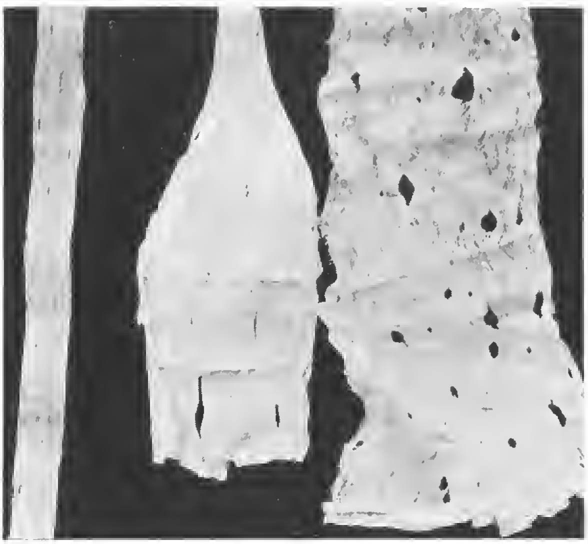


1 2 3

A

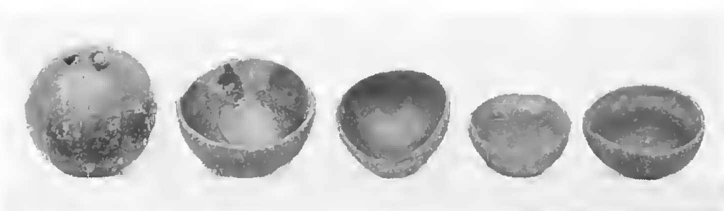


C



1 2 3

B



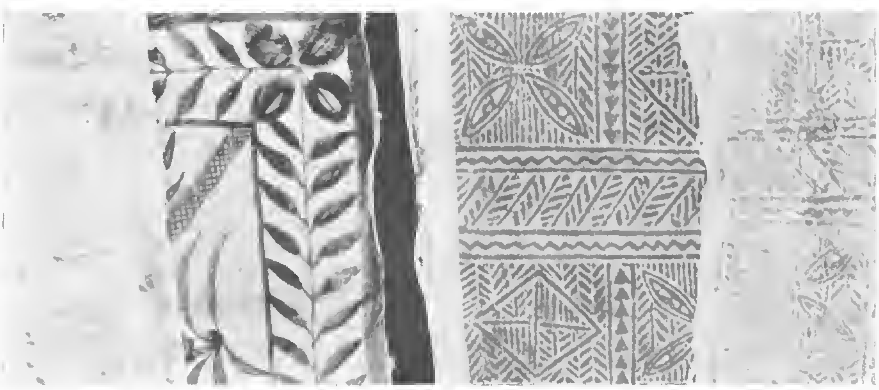
1 2 3 4 5

D

BARK CLOTH AND DYEING UTENSILS.

A

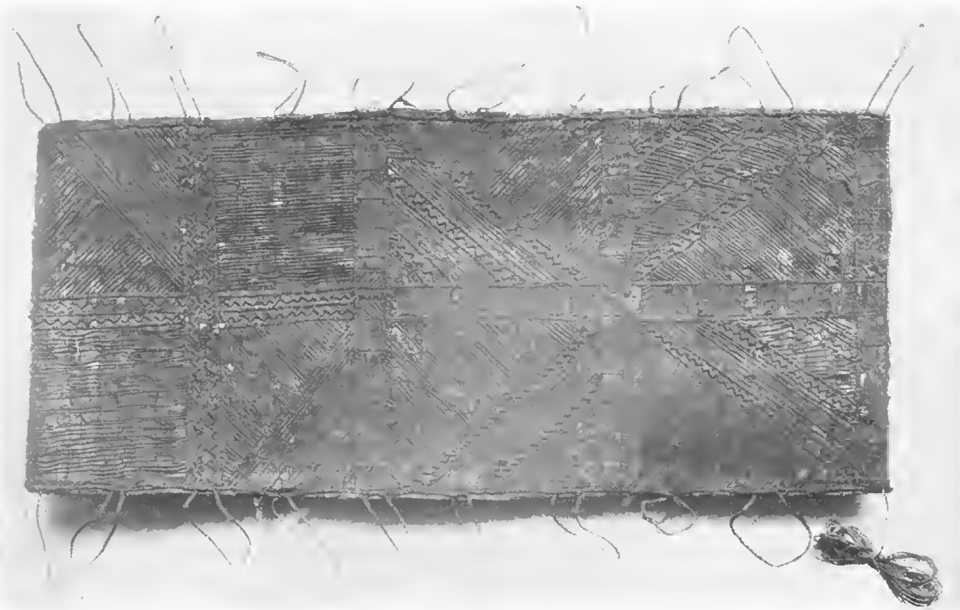
B



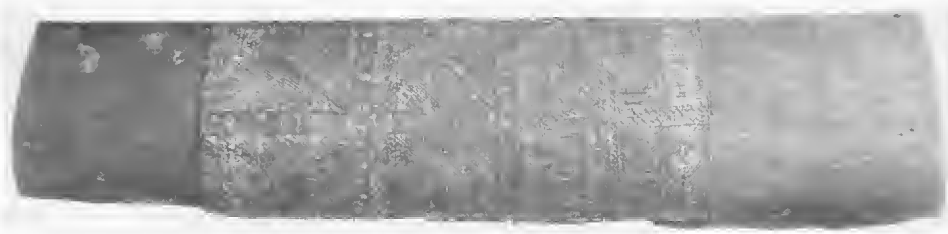
2 1 3 4

C

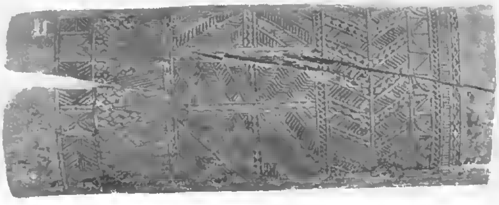
PREPARATION AND USE OF DYE.



A

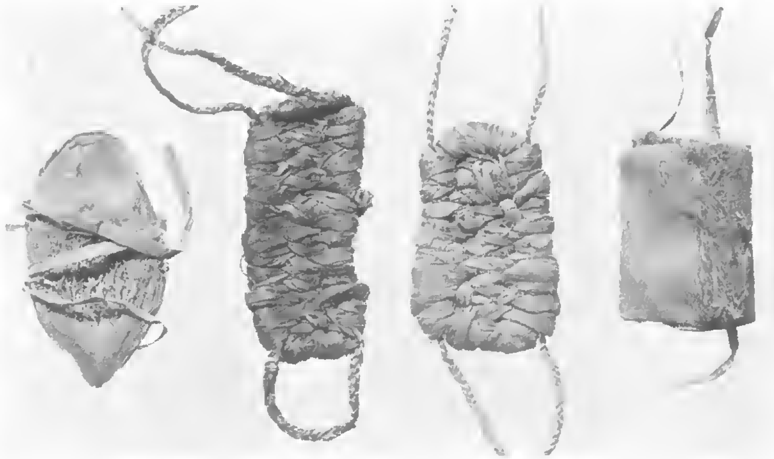


B



C

DYE TABLETS.



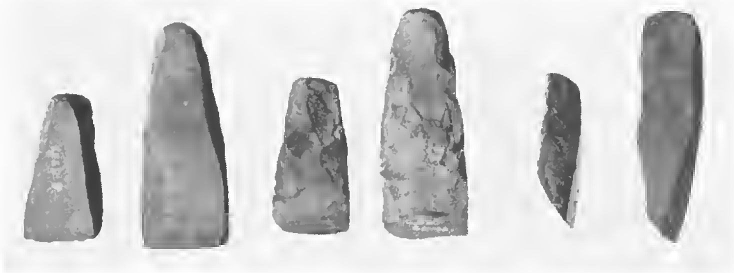
1 2 3 4

A

B

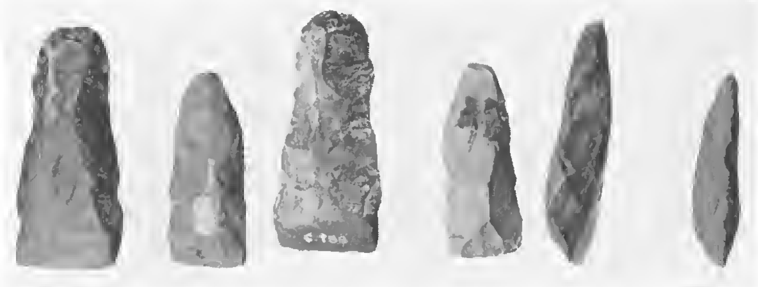
C

SANDALS AND STONEWORK.



1 2 1 2 1 2

A



1 2 1 2 1 2

B

1 2 1 2 1 2

C

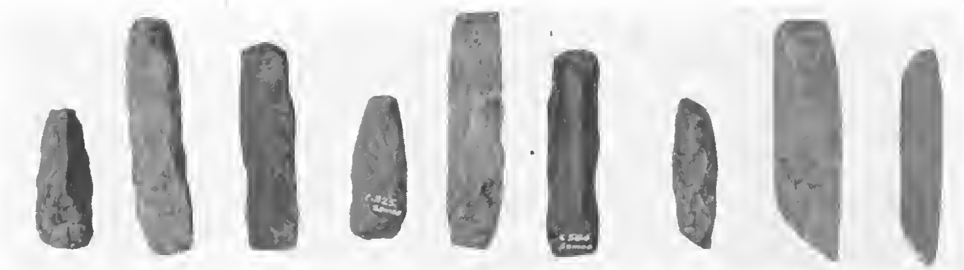
1 2 1 2 1 2

D

ADZES.

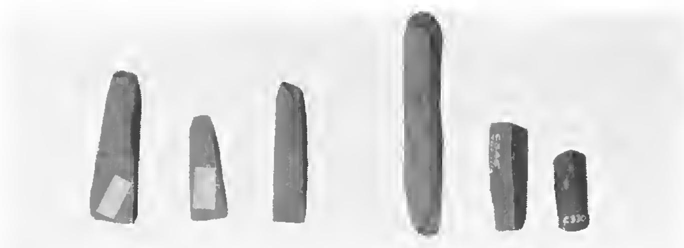
1 2 1 2 1 2

A



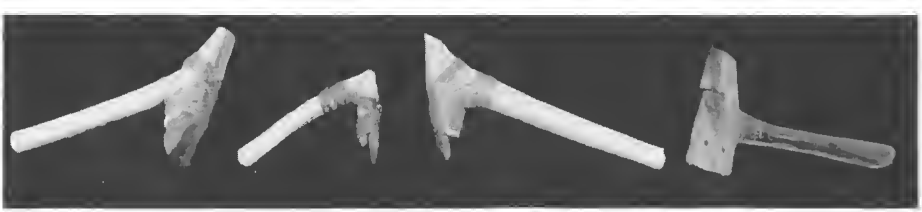
1 2 3 1 2 3 1 2 3

B



1 2 3 4 5 6

C

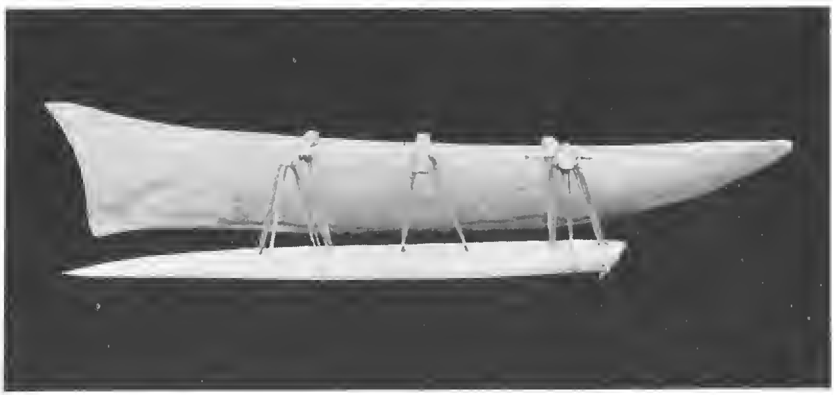


1 2 3 4

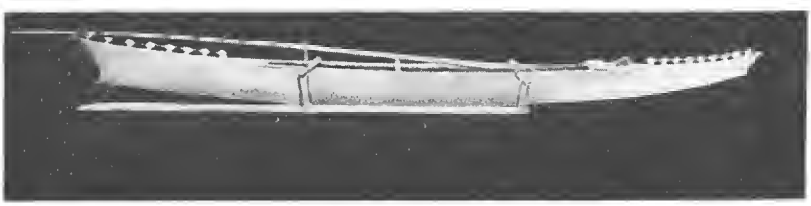
D

ADZES, CHIZELS, AND HAFTED ADZES.

A

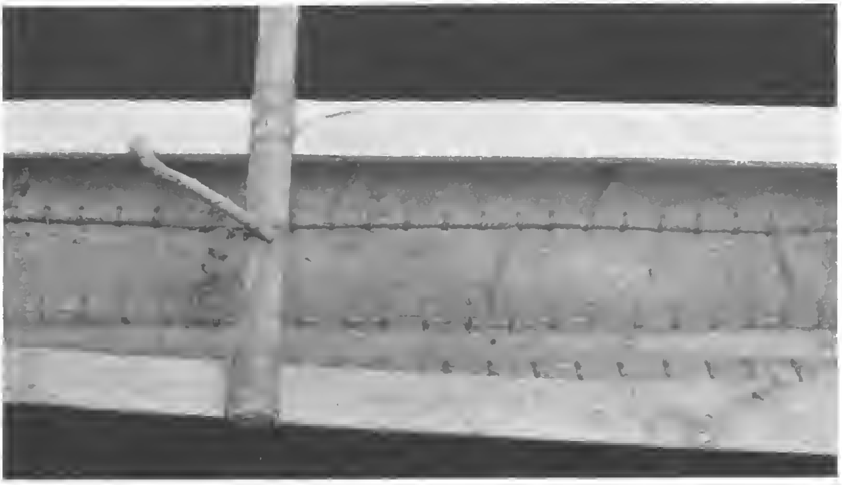


B

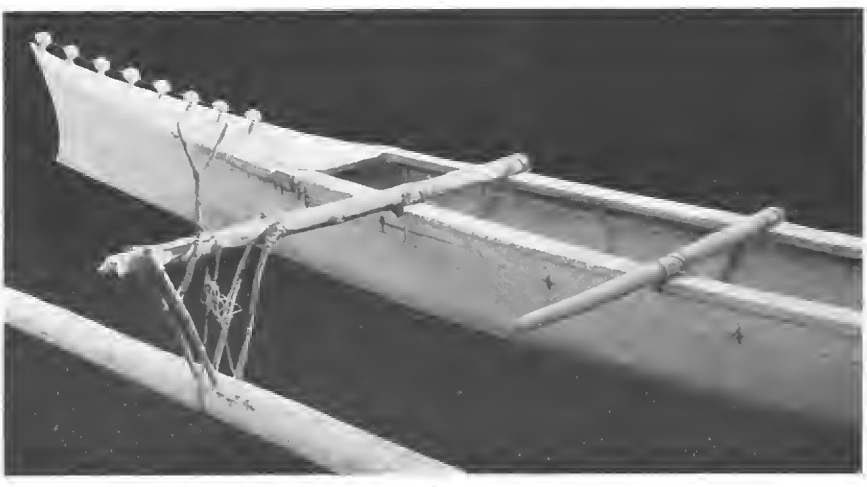


C

CANOES.

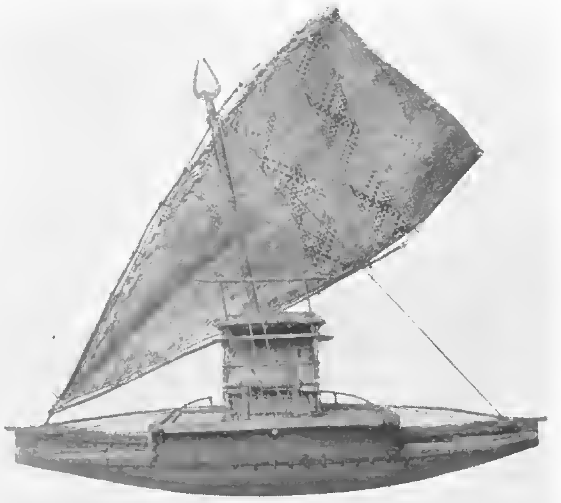


A

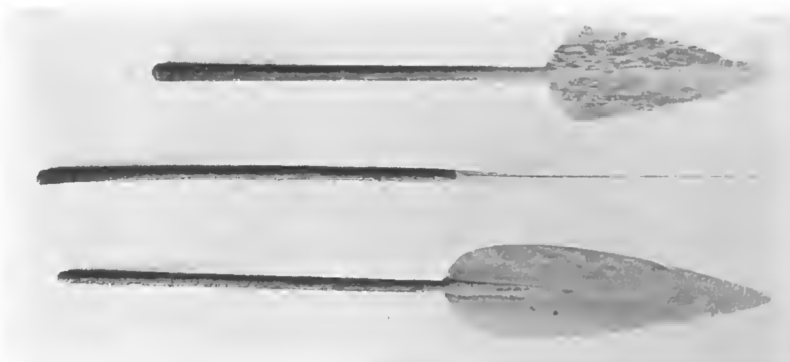


B

BONITO PLANK CANOE.



A

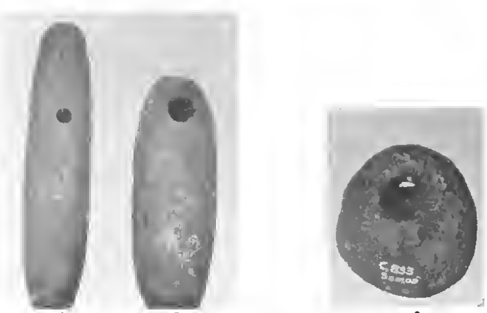


1 2 3

B

1 2

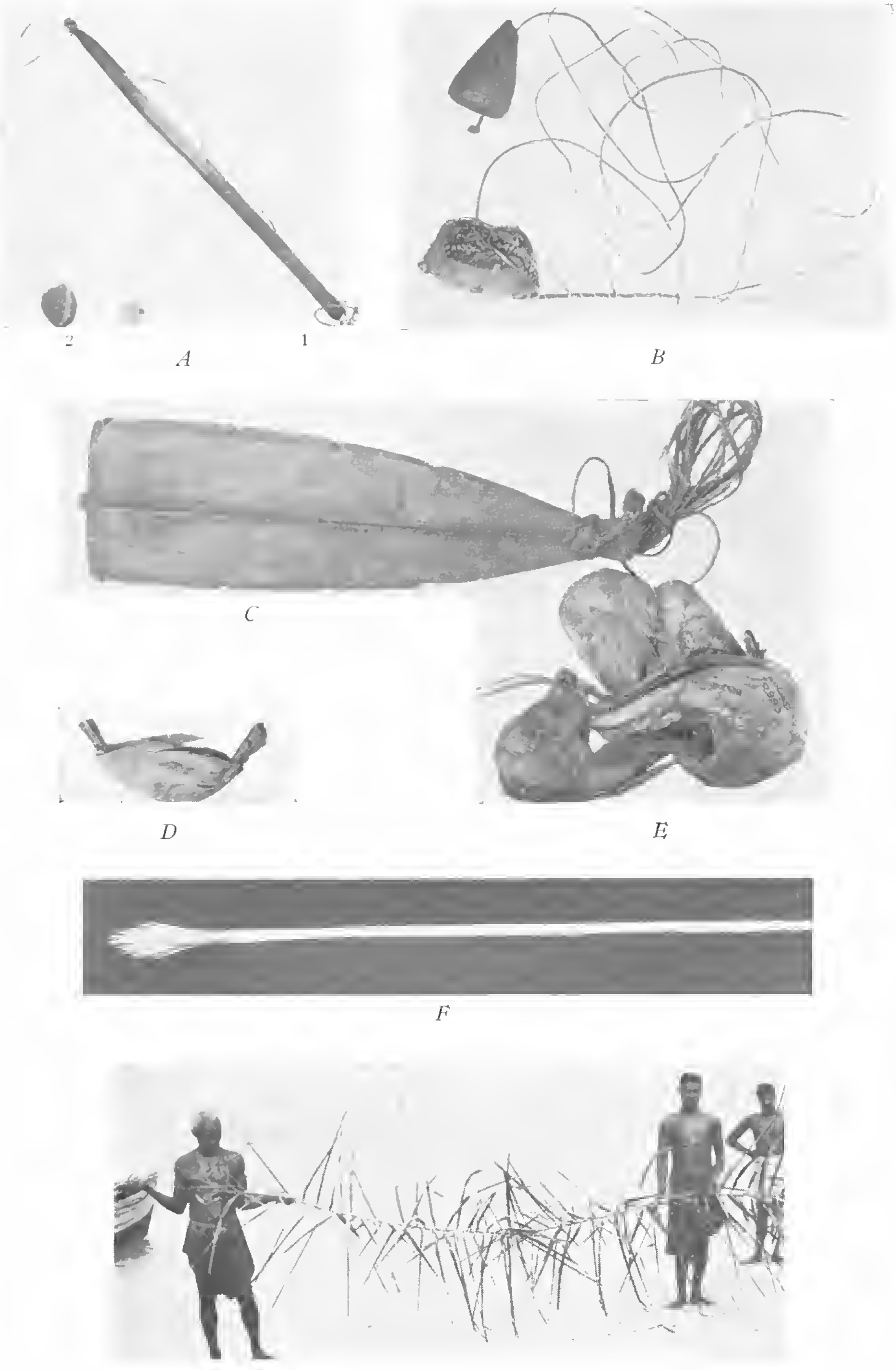
C



1 2 3

D

DOUBLE CANOE, PADDLES, BAILERS, SINKERS, ANCHORS.



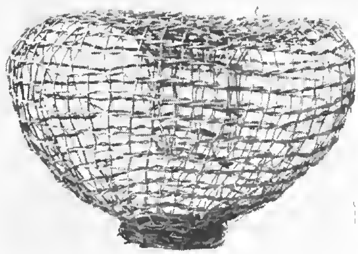
FISHING ACCESSORIES.

A

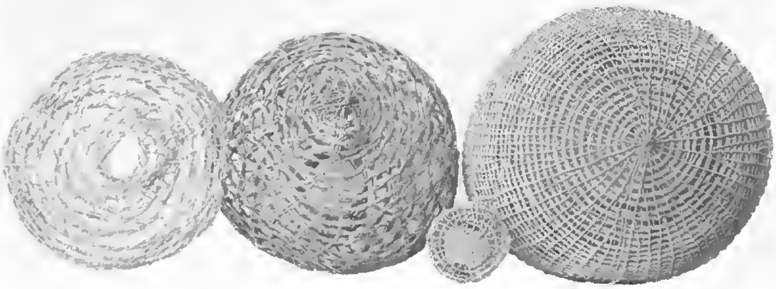
B

C

D



E

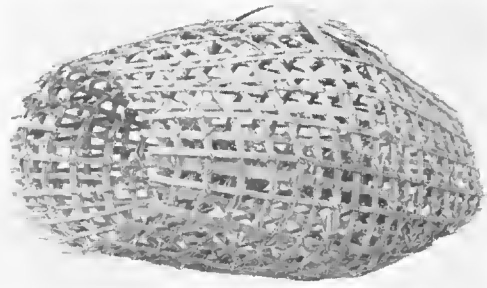


1 2 3 4

F

SENNIT SCOOP AND FISH TRAPS.

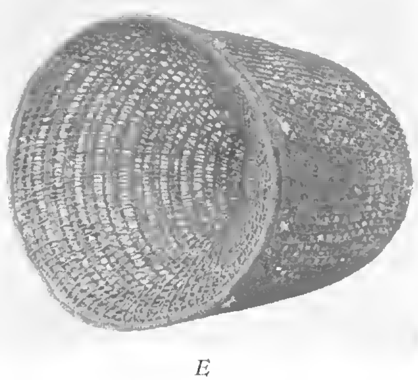
A



B

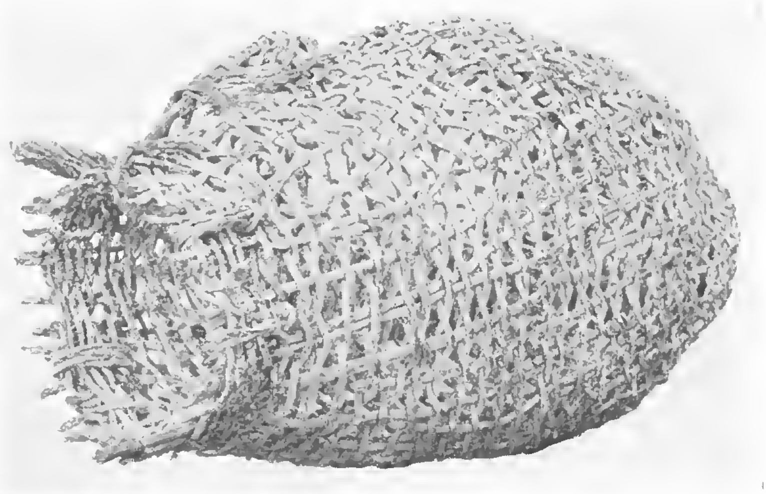
C

D

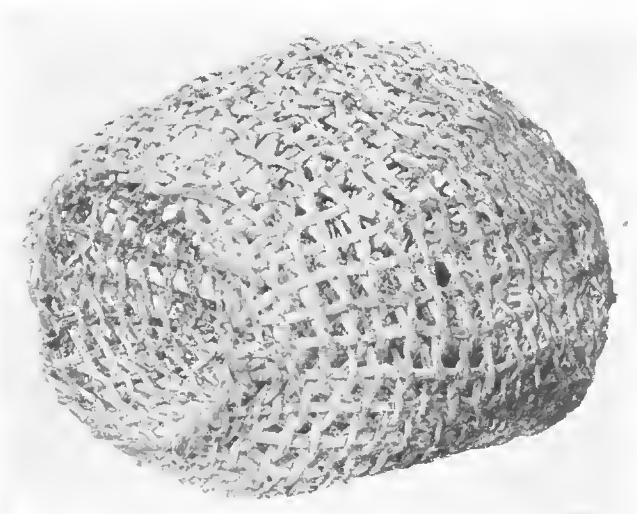


E

FISH TRAPS.



A

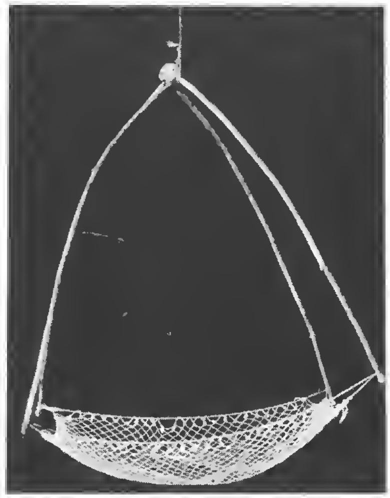


B

FISH TRAPS.

2 3 1

A

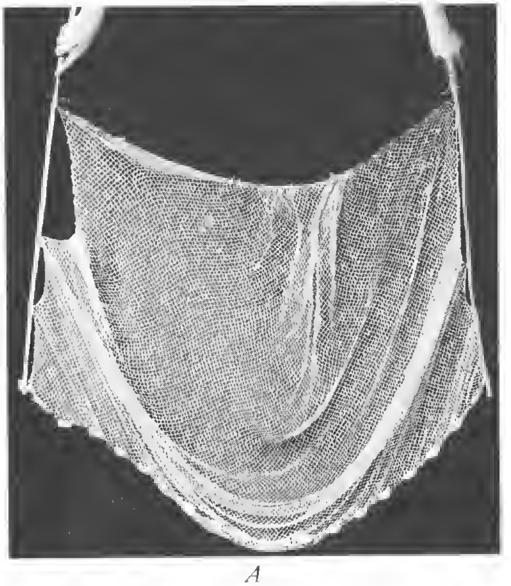


B

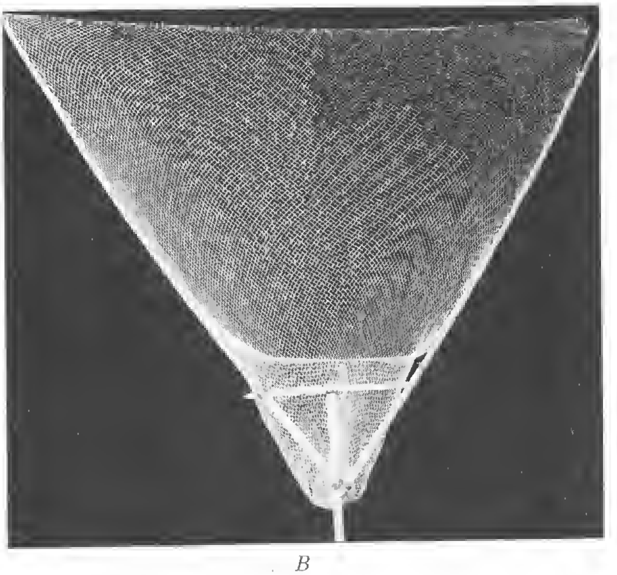
C

D

NETTING IMPLEMENTS AND NETS.



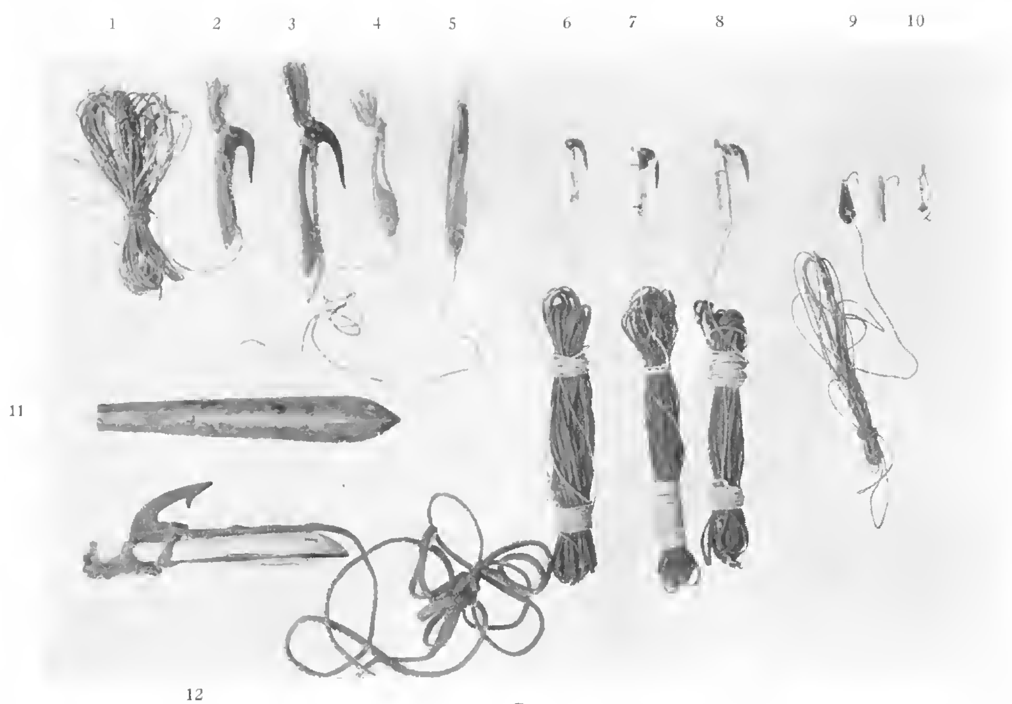
A



B

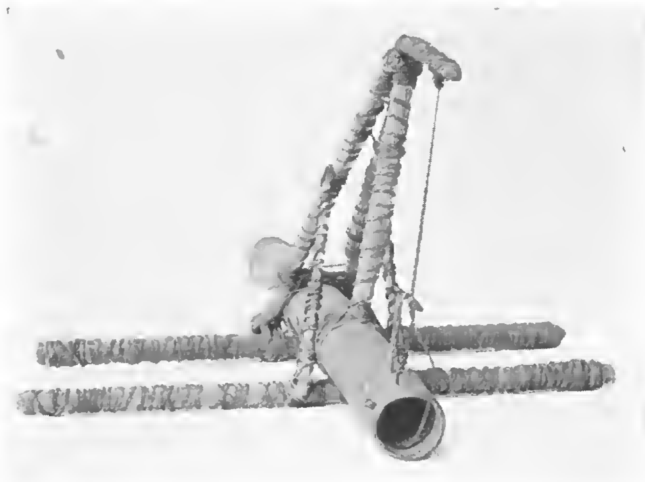
HAND NETS.

A

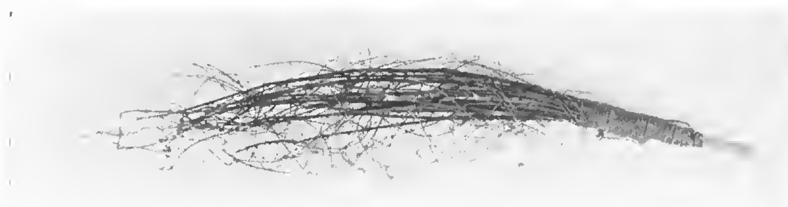


B

FISHHOOKS.



A

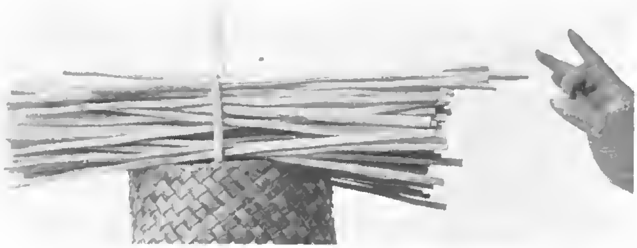


B

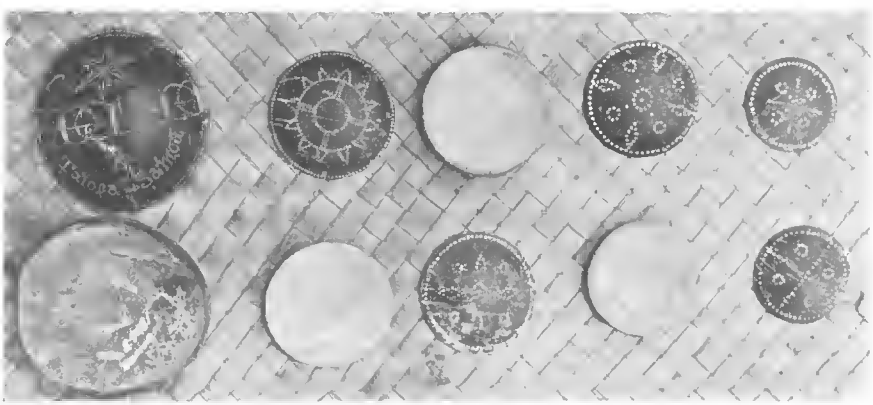
C

RAT TRAP, HOOKING APPLIANCE, BOW AND ARROWS.

A



B



C

PIGEON NET, JACKSTRAWS, AND PITCHING DISKS.

1 2 3 4 5

A

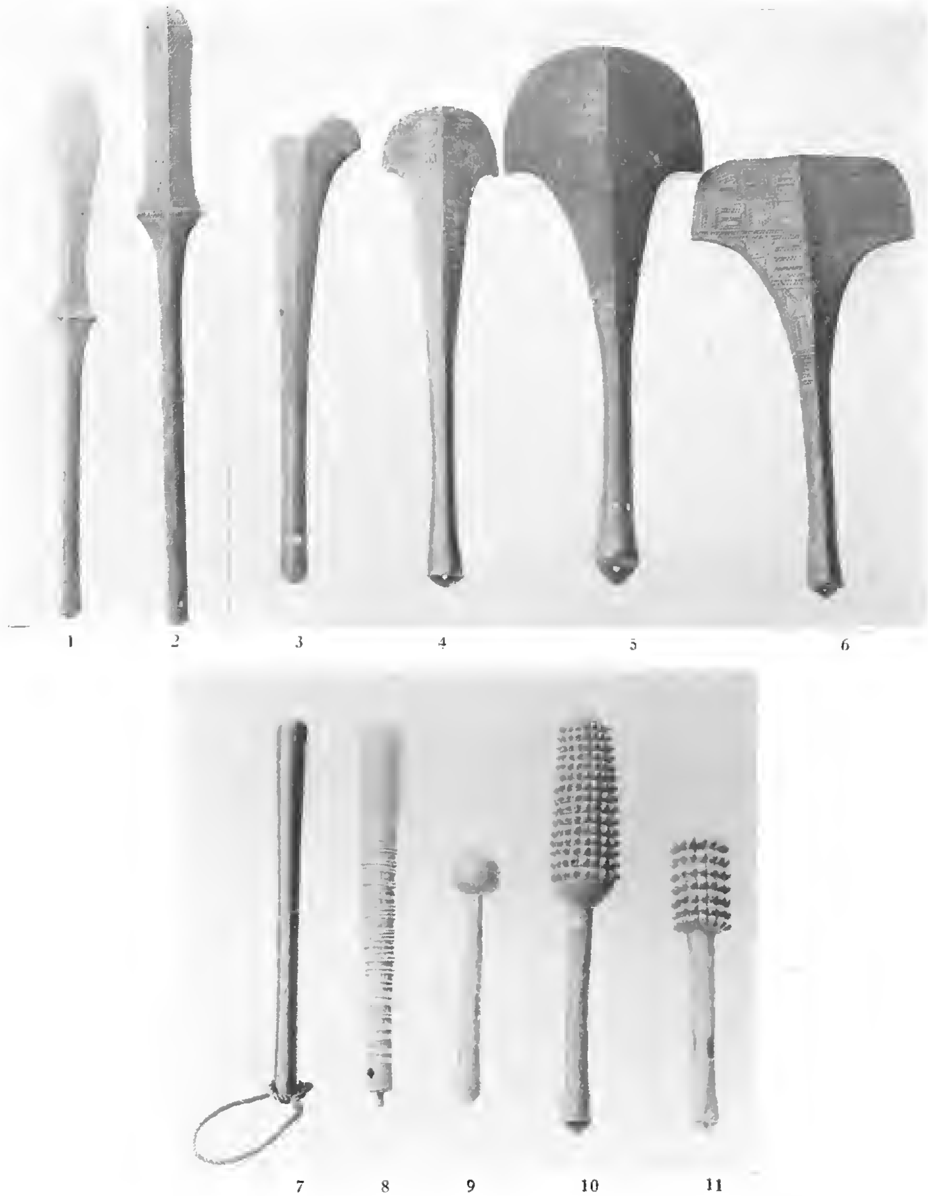
B

C

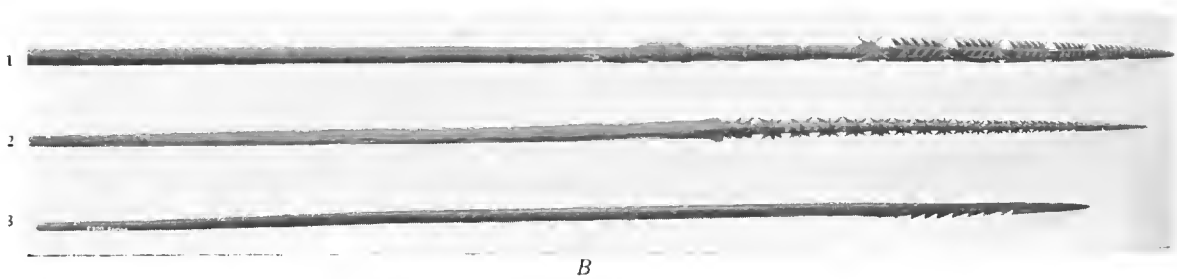
MUSICAL INSTRUMENT AND COCONUT STACKS.

1 2 3 4 5 6 7 8 9

WEAPONS.



A



B

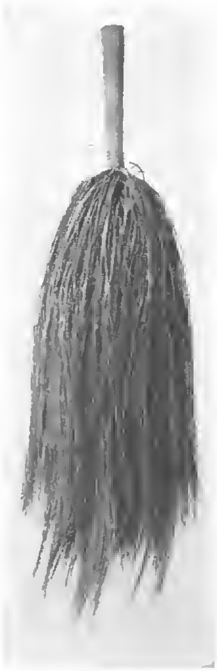
WEAPONS.

A

B

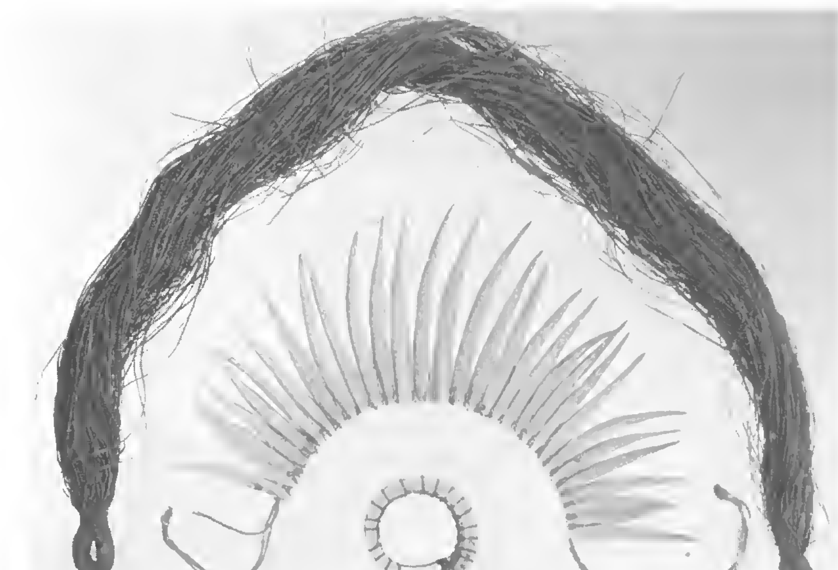
TAUPOU HEADDRESS.

A



B

C



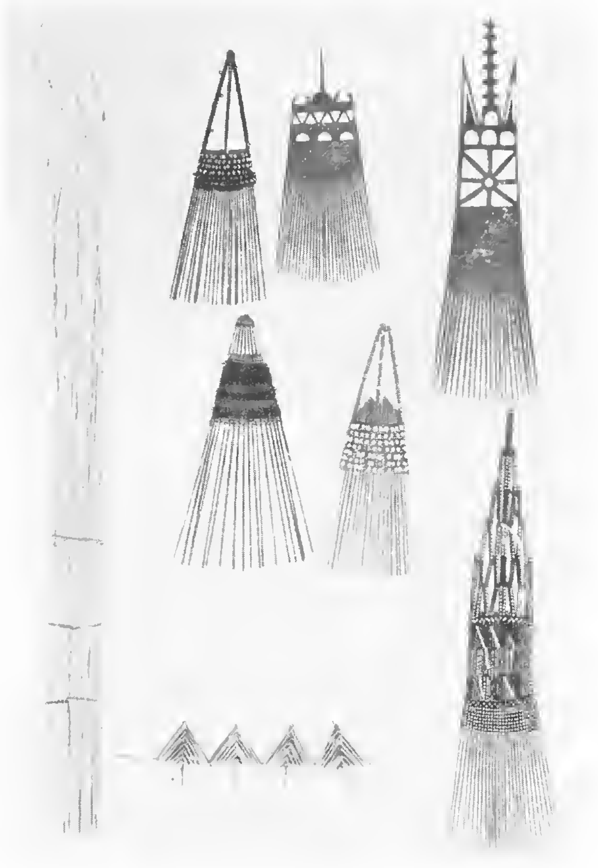
1 2 3

D

FLY WHISKS AND ORNAMENTS

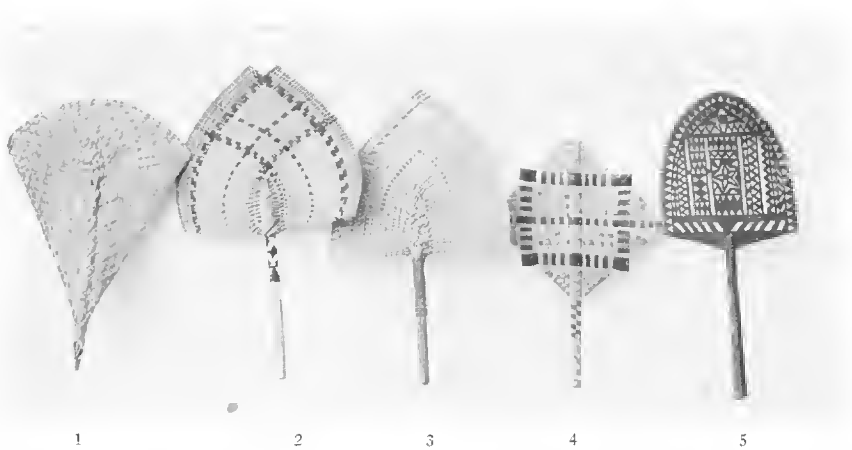
2 3 4

5 6



1 7 8

A

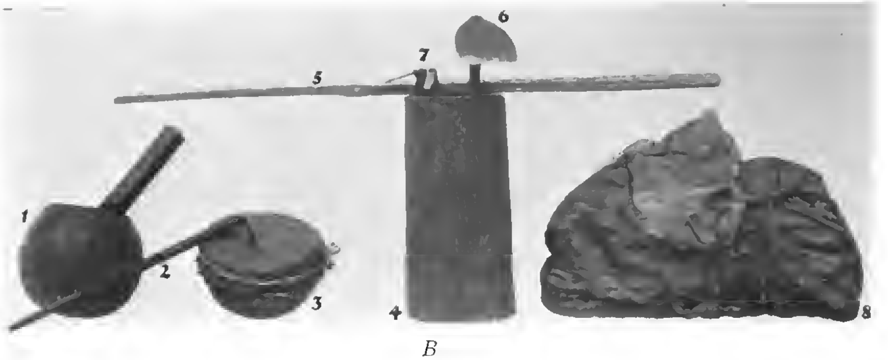


1 2 3 4 5

B

COMBS AND FANS.

A



B

TATTOOING PROCESS AND INSTRUMENTS.

INDEX

A

PAGE
'a'a 439
'a'ano 128
'a'au 475, 536
administration of Samoa 3
adornment 615
adz 332
adz grinding 330
adz haft terminology 357
adz hafting 356
adz lashing 359
adz making 330
adz technique 354
adz terminology 333
adz type summary 354
aenga o le alofi 156
afa 438, 470
'afa 83, 232, 235, 414, 553
'afa fa'aulu po'o 242
'afa fili-tolu 232
'afa langa fa 244
'afa mamanu 242
'afa manu fa'aso'a 242
'afa manu lapotopoto 242
'afa tangai 242
'afa tanganga 243
'afa tua fa 244
'afa tua lima 244
'afa'afalua 247
afato 491
'afauto 473
'afavae 473
afeafe 79, 178, 217, 220
afei 103, 128, 132, 139
afenga 567, 571
afi 104, 123, 142
afifi 104
afio 161
afionga 161
afo 233, 513
afolau 11, 381
afu 415
'afu 312
'afu loto 313
Afzelia bijuga 630
Aglaia 628
'ai 553, 564
ailao 92, 141, 144, 573
ainga 75
aingofie 572
aita 411
aitu 70
aitu langi 613
ala 318
ala i le tia 539
ala i'a 458
ala papa 608
ala'a 288, 439, 577
alaala 512
PAGE
alaala loloa 499
alafanga 372, 492, 510
alai 64
alamea 38
alanga lima 121
alanga vae 121
alangamea 478, 484, 485, 486
alava 104, 114, 129, 135, 137, 420, 425, 527
alavai 547
albacore fishing 676
'ale 307
aleanga 518
alei 519
'ale'o'a 307
Aleurites moluccana 136, 302
'ali 76
'alia 371, 405, 407, 408, 417, 672
ali'i 121
Ali'i Autapua'i 88, 90
Ali'i Fai'oa 88, 90
Ali'i Taufale 90, 91
alili 454
'ali'oa 649
alo 120, 121, 168, 275
aloalo 516
'alo'alo 628
alofanga 492, 508, 510
alofi 156
Alo-maunanae 65, 68
alonga'atu 508
Alphitonia 620
alu 470
Alyxia 628
ama 371, 375, 393
amatasi 371, 404, 405
amo 118
amo pou 31
amoamo 32, 307
amoamo taunoa 32
amonga 227
amu 463, 483, 517
'amu 418, 447
amuamu 597
Ana 552
'ana 583
'anae 439, 478, 486
'anae ngutu mumu 485
'anae Samoa 485
'anamangi 443
anave 606
anchor 369, 414
anga 238
anga'ese 333
angai o le pale 381
angai o tupu 84, 86, 641
angaoso 526
angling 489
ango 111, 135, 255, 297, 299, 306, 385
anklets 630

PAGE

ano 436
ano le tua 642
anoano 101
anthropometric measurements 4
anthropomorphs 611
Antigone reticulata 285, 286, 287, 303
anufe 244, 642
anume 533
Anunsen 6, 66, 355
anvil for beating sennit 236
anvil for siapo 287
ao 153
aoa 533
Apakura (Maori) 612
Apaula 329, 612
'ape (Hawaii) 548
apefa'i 62
'ape-tao 570, 571
apprentice builders 85
Arca sp. 285, 286, 287
arched purlins, preparation 45
arches 46, 52
armlets 630
armour 609
arrowroot 111, 135, 293, 545, 548
arrows 439, 530
Artocarpus incisa 131, 231, 550
Asaphis violacea 285, 287
asi 438, 536
'asi 104, 109, 129, 131, 285, 533
'asi valu 285
aso 641
'aso 35
'aso fausia 83, 86
aso laitiiti 645
aso talitu 655
'aso tapua 464
'aso vao 51
Asplenium nidus 129
asu 414
'ata 443, 548
'ata'ata 517
ate 125
ati 560
'ati ta'ele 619
atingivae 650
ato 607
'ato 189
'ato 'afa 200, 202, 243
'ato 'ato 195
'ato 'ave 'avenga 195
'ato fa'apaupau 207
'ato fili tasi 103, 189, 247
'ato fili tolu 103, 193, 194, 195, 247
'ato fu'e umu 103, 195, 247
'ato lavalava 202
'ato mata 195
'ato to 207
'ato toli 'ulu 195
atofanga 61
atolau 62

PAGE

'atu 124, 497, 520
atualoa 642
atuao 58
atule 432, 443, 446, 477
au 101, 125, 428, 636, 658
'au 106, 356, 475
'a'u 251
au lafo 564
au lama 428
au manga 121
au sama 385
au tapale 555
au tapulu 641
au velo fua 570
aua 439
auala 318
aualuma 75, 142, 248, 320
auamala 510
auamanu 510
auanga 651
'au'au 27, 83
'au'au lunga 35
auauli 476
'au'auli 533
auaunga 277
aufala 583
aufale 534
aufana 530
aufanga 115
aufono 381
aulama 125, 580, 633
'aulape 571
aulata 537
aulauta 534
'auli'i 284, 293
'aulosoloso 99, 486
aumafuti 284, 563, 573
aumanga 126
aumanongi 533
aungaau 579
aupale 540
ausa'alo 104, 110
'ausa'alo 367
'ausi 484
'ausia 567
'ausiti'a 567
'ausulu 333
autala 212
autapua'i 90, 91
autasi 529
'aute 576, 577
auti'a 567
autu'i 112, 132, 137
au'upenga 583
au'u'u 550
auvili 496
'ava 147, 482, 548
'ava fele fo'e 147
'ava mata 92, 162
'ava mua au 163
'ava 'ona 161

	Page
'ava oso	162
'ava pongipongi	162
'ava uso	147, 159, 162
'ava va'ai	147
avangalafu	74
'avasa	444
aveau	551
avei	119, 205
aveloloa	487, 550
axe	333

B

baby mats	207, 223
bailers	414, 508
bait basket	208
bait lures	424
baited hooks	490
Balister	478
ball	552
bamboo	447, 470, 581
bamboo double entrance trap	463
bamboo drum	575
bamboo fish rods	399, 676
bamboo flutes	580, 581
bamboo knife	285, 293
bamboo pillow	666
bamboo rod	489, 503
bamboo stamps	305
banana	134, 526, 545, 549
banana flower	628
banana leaf	583, 630
banana leaf hat	615
banana leaf weir	432
banana leaf whistle	580
banana, native varieties	549
barbed spears	607
barbless spears	607
bark cloth	282, 312, 320, 669, 679
bark cloth turbans	615
Barringtonia sp.	443
basket	189, 202
basket, coiled work	208
basket for storing	80, 206
basket made of sennit	207
batons	606
bats	526
bathing	619
Beasley	423, 489, 490, 493, 494, 497, 514, 515
beaters for kava	152
beaters for siapo	288
beating siapo	287
bed clothes	76, 313
begging parties	248
belt	312
benzine tin	581
betel	311
bilateral-toothed club	594
billet club	583, 588, 606
birds	524
birthmark	641
birth mat	317

	Page
Bischoffia javanica	297
Bixa orellana	299
black candlenut dye	264
black shaggy garment	274
bleached hair	616
blood tie	85
boar's tusk	630, 636
boar's tusk armlet	630
boat canoe	405
body decoration	630
bonito	124, 492, 540
bonito bait	425
bonito boat	371, 407
bonito canoe	380, 399, 403, 414, 417, 506, 553
bonito fishing	506, 520, 615
bonito fleet	518
bonito hook	434, 495, 497
bonito season	509
bonito, status of	520
bonito trolling	497, 676
bow and arrow	439, 526, 530, 542, 613, 676
bow cover of canoe	391
bowling	663, 677
bowl	104, 105, 667
Bougainville	417, 491, 509
braid finish	185
braiding	232
braiding sennit	248
breadfruit	131, 138, 231, 403, 486, 526, 529, 533, 545, 550, 573, 663
breadfruit bast net	470, 487
breadfruit cover	204
breadfruit disc	565
breadfruit glue	293
breadfruit gum	389, 412, 621
breadfruit picker	116
breadfruit pounder	112
breadfruit splitter	114, 667
breast ornament	630
Brigham	273, 283, 305
broom	81
Broussonetia papyrifera	283, 549
Brown, Forest B. H.	212
brush	307
Buck, P. H.	333
buffoon	143
builder	679
builders' union	10
bull roarer	552

C

cairn	322
Colocasia antiquorum	129, 546, 677
Calophyllum inophyllum	106
Canangium odoratum	628
cane	530, 566
candlenut	136, 304, 640
candlenut light	75
cannibalism	127
candlenut kernel	428, 620
candlenut leaves	555, 556, 573

PAGE

canoe....370, 665, 671, 678
canoe builder 415
canoe repair 404
canoe shed....11, 381
canoe, toy 552
canoe usage 414
Capsicum 628
Caranx hippos....445, 492
Carica papaya 135
carpenter 84
carpenter's shed 11
carpenter's tools 23
carrying pole 118
carrying sheet 172
carrying straps 119
Cartwright, Bruce....6, 122, 159, 163
carving of clubs.... 609
Cassis 677
Cassis cornuta 579
cassis shell trumpet.... 579
casting net 480
Casuarina sp. 288
caterpillar 642
caulking canoes....389, 412
Cavendish banana 134
centipede 642, 657
ceremonial kava drinking.... 680
ceremonial kilt storage.... 81
ceremonial meal 140
ceremonial observance 6
ceremonial positions 96
ceremony of post raising.... 91
charcoal 380
check decoration 227
chief's basket 200
chief's food 140
Chinese cast net.... 482
chisel 364
Churchill, 70, 147, 163, 495, 572, 585, 587, 588, 589, 590, 592, 593, 595, 596, 597, 598, 599, 600, 601, 605, 606, 610, 611, 612
Churchward 544
Christianity 613
clapping hands 574
clay 620
climbing bandage 115
cloak 669
clothing 249, 312, 313, 316, 668
clothing customs 317
club....427, 572, 573, 583, 678
club, model for dancing.... 581
cobweb 489
cockroach 561
coconut, 128, 231, 423, 541, 545, 550, 553, 622
coconut cream 128
coconut fish sweep.... 676
coconut grater....110, 137, 667
coconut husk brush.... 307
coconut husker 115
coconut leaf....168, 435, 573, 613

PAGE

coconut leaf fan.... 633
coconut leaf food platter.... 182
coconut leaf mat.... 209
coconut leaf sandal.... 315
coconut leaf toy.... 552
coconut leaf stalk 583
coconut leaf weir.... 432
coconut leaf sweep.... 429
coconut mortar for pigment.... 640
coconut oil....104, 620, 622, 655
coconut scoop 440
coconut shell bailer.... 414
coconut shell discs.... 563
coconut shell disc container.... 564
coconut shoes 552
coconut stalk club.... 589
coconut sauce 128
coconut top and teetotum.... 573
coconut tree target.... 570
coconut, value in cooking.... 136
coconut wood 608
coconut wood bonito hook.... 502
Cocos nucifera 550
coil of sennit....241, 242
coin, equivalent of.... 319
collar beams....39, 97
color design on bark cloth.... 304
colored wefts 228
Columbrina asiatica....273, 620
comb 616, 622
commemorative stone heap.... 322
comparative Polynesian study....661, 662
competitions 543
contract 86
Cooke, C. M., Jr....7, 510, 618
cooking....8, 100
cooking house construction.... 13
cooking process 136
cooking utensils 98
coral disc....565, 573
coral grater 111
cordage terminology 232
Cordia aspera 293
cord....79, 233, 473, 495
Cordyline....249, 313, 316
Cordyline terminalis....103, 136, 231, 548
Cordyline, varieties of.... 250
council house 9
cowrie 628
cowrie shell armlet.... 630
crab 126, 490
crab pot 452
crayfish 443, 479
crayfish pot 453
crayfish snare....420, 422
Crosse, N. E.... 445
cultivation of taro 547
culture and race.... 664
cup 104, 561
cupbearer 154
Curcuma longa....135, 299
curb plate....45, 49

PAGE
curtain 79
Cynatium tritonis 579
Cypholopus macrocephalus 267
Cypraea 474
Cypraea mauritiana 480, 510
Cypraea ovula 613
Cypraea tigris 435

D

dam 433
dance accessories 581
dance time implement 574
dancing 574
dart 566, 573
dart throwing 566, 569, 677
death 317
deck house of double canoe 409
decoration 615
decoration in plaiting 227
decoration of clothing 316
decorative adornment 634
decoy 541
decoy dove 529
decoy pigeons 533
defensive wall 322
Demandt, 428, 475, 478, 492, 493, 494, 512, 514, 515, 516, 536
design tablet 308
diet 138
digging stick 545
Dioscorea sp. 546
dip net 474, 475
disc 573
disc pitching 563
disc throwing 565
distribution of kava 156
diving for fish 420
dog 126
dogs admitted to house 80
dolphin 404, 492
dolphin fishing 676
dolphin hook 492
double canoe 371, 407
double entrance trap 458
dove 123, 526, 542
dove decoy 677
dove trap 529
dowry 317
draft game 677
drill 495, 496
drinking cup 104
drinking nut 130
drinking water 139
drum 574, 578, 582, 677, 679
du'afa'a 119
duck's feet 557
dugout canoe 371, 671
dwelling house 8, 16
dye 297
dye, vegetable 104
dyeing by immersion 306
dyeing siapo 294

E

PAGE
ea 550
ear lobe 601
ear ornament 627
ear-shaped club 601
earth oven 100
eave batten 39
Echinus 496
Edge-Partington, 150, 207, 358, 363, 440, 475, 490, 588, 589, 590, 592, 596, 597, 598, 599, 600, 602, 603, 630
eel 126, 418, 523
eel hook 491
eel lover 128
eel snare 420, 422
eight-spiked club 592
'ele 303, 304, 309
eleele 385
elei 306, 308
Ella, Samuel 291, 305, 311, 312, 313, 406
Emory, K. P. 7, 333
enaena 498
'ena'ena 273
'engu 454
'enu, 432, 439, 452, 454, 455, 465, 466, 469, 476
'enu lau'a'a 440
'enu tuaniu 440
Erythrina indica 313, 628
esi 135
Etau 532, 536, 539
'ete 195
'ete li'i 206
'ete mamanu 206
etiquette of leg stretching 75
Eugenia malaccensis 304
Eugenia neurocalyx 628
Eugenia sp. 628
Evodia hortensis 628
eye shade 231, 537

F

fa 130, 131, 570
fa tangi 245
fa'aali'i 577, 578
fa'aali'i-la-iti 580
fa'aalo 225
fa'aaloalo 91, 140, 145, 301
fa'aao 509
fa'aau 388
fa'a'au 177, 184, 200
fa'aaufala 584, 589
fa'aenaena 616
fa'afatuamanga 225
fa'afatupa'o 131
fa'afetai 157
fa'afiti le mu'a 146
fa'afulu lupe 57, 384
fa'a'i 580
fa'aifo 539, 647
fa'aifo i tualima 539
fa'aila 641, 654

	Page
fa'aili	580
fa'aili laufa'i	580
fa'aili laupaongo	580
fa'aili lauti	580
fa'aili niu vao	579
fa'aili ofe	580
fa'ala	274, 292
fa'alafanua	333
fa'alata	529
fa'alaufa'i	584, 594, 603, 604
fa'alaui'a	104, 123
fa'alautalinga	584, 601
fa'alave	388, 399
fa'alele	70, 567
fa'alele senga	527
fa'alelenga lupe	556
fa'alifo talo	129
fa'alifo ufi	133
fa'alupe lau lama	556
fa'alupenga	6, 160
fa'amafoloa	212
fa'amailei ato	489
fa'amalu	286
fa'amama	104, 114, 300
Faamalu	613
fa'amasau	567
fa'amasina	212
fa'amata	151
fa'amau	462
fa'amavaenga	562
fa'amu	610
fa'amuli'ali'ao	610
fa'anga'ai	610
fa'anunuta	572
fa'aopoopo	385
fa'aotanga	134
fa'apa'o'o process of dying	295
fa'apapa	104, 129, 134
fa'api'opi'o	225, 228
fa'apo	427
Faapuaa	6
fa'apulou	154
fa'asafune	122
fa'asavangatunu	482
fa'asavili	274
fa'ase'enga	552, 553
fa'asoasoa	154
fa'asoata	12, 409, 410
fa'asosolo	381
Faasua-i-au	233, 443, 522
fa'asumu	225
fa'ata'a	232, 237, 246, 631
fa'atafiti	64, 175
fa'ataisi	104
fa'atala	226
fa'atala lau paongo	607
fa'atalatala	221
fa'atata	514
fa'atau	448
fa'atau manu tangi	529
Faatausili	329
fa'atavaitui	616
fa'atofa le 'upenga	487
fa'atoro'a	434
fa'atu	450
fa'atufunganga	23
fa'atumu	423
fa'atunga	26, 91, 94
fa'aulu	217
Faauma-i-tuavao	319
fa'aumatanga	96
fa'aune	23
fa'ausi, 104, 105, 111, 129, 136, 144, 183,	550
fa'ausi fua fulu	130
fa'ausi malaulau	130
fa'ausi soa'a	135, 137
fa'ausi talo	129, 137
fa'ausu	520
fa'autouto	383, 384, 427, 453, 492
fa'avaeuli	610
fafa	119
fafai	296, 533
fafai u'a	285
fafanga	119
fafangu	576
fafao	564
fafau	359
fafau matau	492
fafie	99
fa'i	134, 549
fa'i, native varieties of	549
fa'i ololo	134, 137
fa'i papalangi	134
fa'i pata	134, 526
fa'i puta	549
fa'i tao malaulau	134
fa'i taopa'ua	134
fa'i tunu	134
fai'ai	123, 128, 136
fai'ai esi	135
fai'ai fe'e	126, 420
fai'ai i'a	123
fai'ai limu	136
fai'ai malasina	135
fai'ai pa'a	126
fai'ai talo	104
fai'ai tolo	129
fai u'a	285, 287
fai'ai valuvalu	129
fai'ai valuvalu ufi	133
fai'ai vatia	135
faifeau	142
fainga	299
fai'oa	90
Faioso	639, 643, 644, 645, 646, 655
faivaaulima	572
fala	75, 206, 211, 574, 628
fala lili'i	223
fala mat	216
fala moenga	216
fale afolau	9, 19, 20, 69, 87
fale angai	88

	Page
fale fa'aasu	313
fale fa'alaufao	69
fale lalanga	70, 248, 320
fale lupe	539
fale matua	70, 534
fale moa	70
fale moa pa'u	528
fale moa tali	528
fale mua	70, 534
fale nuanga	299
fale o'o	8, 16, 70
fale sa	562
fale seu	70, 534
fale ta	11, 70
fale ta'a	70
fale tala mutu	89
fale tele	9, 19, 22, 69, 83, 87, 326
fale tolu	70, 93
fale 'ulu	19, 69
fale umu	8, 13, 69
fale va'ai	70, 534
fale vao	16, 19, 69
faleafa	69
faleaina	69
faleaitu	70
fale'amu	452, 454
faleapifangota	70
falefa	70
falefa'aafolau	69
falefuitui	69
falelauasi	70
falelaupola	69
falelele	534
falelima	70
falema'a	69, 324, 328
falemanu'a	409
falema'o	69
faleniu	70
fale'oa	70
faleofei	69
faleolamea	69
Fale-o-le-Fe'e	70, 324, 370, 670
faleoloa	70
Faleomavaenga	143, 160
falepuipui	70
falesae	69
Falesau	70, 143, 157, 159, 160
faletalimalo	69
faleto'a	69
faletofa	69
faletua	70
Faleula	70, 84
faleuli	69
faleupolu	70
falu lau	65
famai	548
fan	633
fana	410, 414
fanga	419, 548
fanga fa'atau tu'u'u	447
fanga i lupe le la	534

	Page
fanga i'a	198, 450, 463
fanga i'o	249, 254, 255
fanga pa'a	452
fanga puapua'i	450
fanga pusi	466
fanga tapi	463
fanga ula	453
fanga'au	312
fangafanga	116
Fangai	531
fangai'o	249, 255
fanganga	242
fanganiu	430
fanga'ofe	447, 463
fangau	312
fangauli	447, 458
fangu	105
fangufangu	580
faniu	408
fanning	139
fanua tanu	70
fao	370
Fao	543
faofao	579
farau (Tahiti)	12
fasa	212
fasi	103
fasi 'ava	147, 160
fata	70, 71, 80, 124
fata tele	410
fatamanu	24, 48, 83
fatau	406
fatu	115, 254, 548
fatu a fau	234
fatu fa'afei'i	254
fatu-amu	418
fatuati	418
fatuaua	510, 511
fatunga	29, 30, 83
fatu'ulu	65
fau, 83, 114, 118, 119, 231, 315, 372, 375, 386, 393, 403, 414, 473, 491, 536, 538, 550, 569, 608, 628, 640	
fau bark	553, 565
fau brush	307
fau clothing	249
fau olonga	231
fau pata	249, 265, 267, 272
fau sasae	45, 84
fau songa, 231, 232, 233, 234, 240, 244, 293, 470, 490, 495, 499, 512, 513, 608, 616	
fau tangaloa	267
fau tau 'ava	151
fau tu	95, 231, 267, 470
fau vaenga	48
faufafa	119
faufau tu	615
faufili	119
Faumuina	322, 369
fausa	268, 277, 428
fausala	510

PAGE

fausanga 409
fausanga fa'a'iato 394
fausanga i'u 499, 500, 512
fausanga loto 499, 500, 512
fausanga selu 580
fautasi 12, 371, 577
fauvae 473
feast 90
feather 495, 512
feather decoration 249
feather hackle 513
feather kilt 256, 669
featherwork 668
featherwork of Hawaii 662
fe'e 126, 438, 573, 613
fefulitua 572
felana 492
Fepulea'i, see Ripley
Fetaia'i-ma-uso 159, 163
fete pulu 235
fetu 86
fetui 101
fiber plants 231
Ficus sp. 231
fifi 104
fifi fau 151
Fijian parrakeet 281
Filelei 658, 660
fili 119, 181, 185, 232, 238
fili anufe 244
filinga lau'ie 276
filoa 445
filofiloa 427
final feast in house building 96
fine mat 211, 275, 521, 630, 668, 679
fine mat kilt 266
finger bowl 139
fire 98
fire making 99
fire plough 99
fireplace 74
firewood 99
fish 123, 138
fish basket 195, 228, 418, 432, 441
fish dam 432
fish distribution 521
fish line 232, 513
fish narcotizing 443, 676
fish poison 112, 550
fish pot 450
fish snare 420
fish spear 438
fish trap 198, 446, 542
fish weir 444
fishing 418, 676
fishing observances and prohibitions 519
fishing stick 419
fishing usage and custom 517
fishing with hand trolling hook 514
fisi 103
fisoa 273, 620

PAGE

fiti 563, 581, 677
Fiti 402
five-ply braid 244, 247
flesh foods 119
flies 139, 634
floats 427, 473
floor mat 75
flowers 622
flower necklace 628
flute 580, 581
fly flap 662
fly whisk 631
flying fish float 427
flying fish hook 428
flying fox 524, 532, 542
flying fox net 526
foa 330
foafoa 381, 510, 514, 579
foanga 332, 495
foe 583
fofo'e 103, 109, 113, 132, 284
folafola le ta'alolo 146
fole 490
foma'i 142
fonga 621
fongatia 539
fono 9, 22, 571
fonoti 441
food 80, 98, 119, 541, 667
food customs 140
food plants 546
food platter 182
food pounder 679
food pounding 667
food preparation 103
food serving 139
food stirrer 115
food utensil 108
foreign influence on clubs 611
form of contract 88
forms of kava 162
fortification 322
fort 609
four-ply braid 244
four-ply round sennit 244
fowl 122, 424, 527
fowl excluded from houses 80
fowl trap 527, 528
fowling 526, 542
fowling house 534
fowling net 536
Fraser 204, 564
fresh water shell 628
Freycinetia 211, 433, 447
fua 607, 616
fu'a 233
fu'afu'a 403, 439, 563, 566
fua'ivai 105
fuao 527
fuata 439, 550
fue 119, 414, 631

	Page
fu'e	103
fu'e fua	373
fu'efu'e	520
fuevai	433
fufanga	172
fufu'e	373, 388
fuia	540
fui'ava	91, 94
Fuimaono	297
fuinonu	306
fuinu'u	547
fuiono	616
fuipani	306
Fulualela	551
fune	132
funga	463, 527, 541
funga lata	548
fungafunga	237
Fungia	111, 443
funnel trap	454
furniture	666
fusi	281, 658
fusi siapo	312
fusi ta	641
fusina	570
fusiua	253
futi opa	539
futia	400, 401, 404, 507
futu	403, 443, 444

G

games	552, 574, 677
garfish	489
garment	630
garments, transitional	274
geography of Samoa	3
geometrical motive	228
Gifford, E. W.	4
ginger	628
gods	613
gong	575, 581
gorges	489
Gosche	493, 580
gouge	367
grater	110
grater, stone	367
grave	322
greeting	161
Gregory, Herbert E.	332
grinding	330
groping	418
ground netting	537
grub	491
Gudger	493
guest house	9, 19
guild	679
guild of builders	84
guild of carpenters	6
gunwale of canoe	390

H

	Page
Haddon	557
hair cutting	616, 621
hair dressing	621
hair, human	615
hair ornamentation	619
hair perfume	620
halau (Hawaii)	12
halbert-shaped club	597
hammer stone	331
hand net	474
hand rod trolling hook	514
Handy, E. S. C., 4, 20, 44, 57, 60, 63, 84, 85, 86, 111, 130, 557, 650, 652, 655, 660, 680	
hat	615
hatu rua (Cook)	217
Hawaiki	417
head fisherman	517
headdress	615
heated stones	100
heiau (Hawaii)	613, 670
Heliconia bihai	113
Henry, Teuira	673
hereditary rights	521
hermit crab	438
Hernandia peltata	628
Hibiscus tetraphyllus	267
Hibiscus tiliaceus	231, 267
Hiro (Society)	673
history of canoe making	417
hook	489, 490
hook, kinds of	514
hook club	603
hook lashing	499
hook making prohibitions	520
hook obtaining custom	520
hook rest	505
hook types	494
hooking appliance	526
hopai (Cook)	475
Hornell	557, 563
horau (Tuamotus)	12
horticulture	544, 677
hospitality	142
hospitality to strangers	146
house	8, 665, 679
house accessories	169
house building	23, 247, 679
house furnishings	71
house names	69
house, origin of	82
house platform	66, 321
house protection	82
house, rounded	666
house, stone	324
house terminology	10
house, types of	11
human hair belt	630
human hair headdress	615
hunting	524, 676

I

Page
i'a ... 123, 450
i'a sina ... 432, 455, 477
iao ... 526
'iato ... 371, 375, 392, 407, 412
'iato loto ... 393
'iato mua ... 393
'iato muli ... 393
'iatolima ... 371, 378, 380, 493, 672
idols ... 614
i'e ... 288
i'e mole ... 288, 289
i'e teuteu ... 288
i'e tosi ... 288, 289
i'e tusitusi ... 291, 312
'ie ... 211, 249
'ie e fai a'i le langi ... 317
'ie e fai a'i tonga ... 317
'ie fa'atupu ... 317
'ie fau ... 249, 266, 267, 273, 297, 316, 320
'ie fuipani ... 274
'ie kilts ... 259
'ie lavalava ... 266
'ie moenga ... 226
'ie sina ... 249, 266, 272, 273, 316, 317, 320
'ie ta'ele ... 273
'ie tonga ... 211, 226, 231, 249, 275, 317
'ie tutu pupu'u ... 260, 316
'ie'ie ... 211, 433, 447, 450, 529
ifi ... 85, 103, 413
ifiifi ... 620
ifilele ... 106, 382, 406, 597, 630
'i'i ... 146
'i'i le pua'a ... 146
ila ... 641
ili ... 443, 522, 563, 633
ili aulamalama ... 633
ili fala ... 633
ili pau ... 634
ili tea ... 169, 633
iliili ... 285
'ili'ili ... 68
Imoa-ita ... 65
Imoa-sina ... 65
'imoa ... 524
implements of horticulture ... 545
ina'i ... 138, 146, 541
industrial strike ... 89
ingafo ... 508, 519
ingana ... 418, 439, 443, 522
ingana fish scoop nets ... 207, 442
ingunga ... 141
injuries to builders ... 96
io ... 125
io alo ... 124
io tua ... 124
i'o fanga ... 241, 380, 556
i'o fatu ... 115
iofi ... 101, 109, 120, 137, 300
'iole ... 524
Ipomoea batatas ... 133, 548

Page
ipu ... 128, 158, 561, 581
ipu 'ava ... 150
ipu niu ... 104
ipu tu'i lama ... 640
ipu tu'u lama ... 640
ironwood ... 403, 583
ise ... 489
'isumu ... 438, 524
itu ... 96
itu mea tele ... 121
itu pale asu ... 121
itu tauanga vale ... 169
itu taumatau ... 169
itulasi ... 578
i'u ... 125, 499
ivi muli ulu ... 121
iviivi ... 30, 388
ivitu ... 645

J

Judd, A. F., 6, 7, 78, 111, 122, 127, 141, 156, 159, 162, 163, 208, 291, 322, 323, 333, 369, 438, 487, 497, 502, 547, 548, 550, 577, 614. See also Laloifi.
jackstones ... 553, 573
jackstraws ... 563, 573, 677
Jennings, Eli ... 407
jew's harp ... 552, 580, 678
joining siapo strip ... 296

K

kafungi ... 655
kahara (Cook) ... 678
Kalala ... 78
kapa (Hawaii) ... 282
kape (Polynesian) ... 548
kapulu ... 655
kava, 92, 98, 104, 138, 141, 147, 312, 415, 545, 548, 641, 679. See also 'ava.
kava anvil ... 152
kava beater ... 152
kava bowl ... 148, 667
kava ceremony ... 156, 160
kava chewing ... 152
kava cup calling ... 140
kava cup title ... 158
kava distribution ... 156
kava drinking ... 155
kava drinking cup ... 150
kava, medicinal value ... 163
kava naming ceremony ... 159
kava, order of serving ... 157
kava pounding ... 104, 112
kava preparation ... 153
kava serving ... 154
kava strainer ... 113, 114, 151, 254
kava utensils ... 147
ke'a (Hawaii) ... 565
keel fitting ... 385
kete (Maori) ... 195
kilt ... 249, 312, 668

PAGE

kioe (Hawaii) 470
kitchen 98
kite 555, 677
knives 109
knives, stone 368
knobbed throwing club 606
Kramer 108, 112, 123, 129, 130, 131, 133, 135, 274, 370, 378, 404, 406, 410, 428, 440, 446, 478, 490, 493 508, 536, 588, 589, 590, 592, 593, 598, 599, 600, 601, 604, 605, 606, 614, 639, 644
kuri (Maori) 126
kuru (Maori) 131

L

la 410
la'au 99
la'au fa'afiti 528
la'au fa'alava 528
la'au fange'a 30
la'au manga 528
la'au matua 32, 83
la'au milo 528
la'au sa'eu 115
la'au sao 517
la'au sautia 32
la'au taofi 528
la'au taunoa 32
la'au tauvale 32
la'au tu'itu'i ma'a 419
Laauli 543
ladder 62, 539
la'ei 383, 437
lafalafa 236
lafi 359
lafi lalo 291
lafi lunga 292
lafo 232, 246, 447, 469, 470
lafoa'i 520
lafonga 147, 677
lafonga tupe 563
lafulafu 544
la'i 133
lalama 474
lalanga 216, 232
lalanga atoa 225
lalanga lua 225
lalanga tasi 216
lali 575, 576, 577, 581
lalo 499
Laloifi....70, 141, 143, 158, 159, 160 (See also Judd)
Lalolangi 14
lama 136, 216, 231, 264, 297, 302, 306, 312, 428, 640
lamp 74
landshell 628
langa 232
langa'ali 620, 628
langalanga 286
langasese 628

PAGE

langatila 339
langi 84, 317
Langi Filoa 155
lango mumu 552
lango pu'e 46
langolango 32, 101, 500, 502, 512
langolau 39
lango'ofe 400, 401
language of Samoa 4
laoa 399
lapa 111, 443
lapalapa 168, 208, 553, 572, 583, 591
lashing canoe parts 385
lashing for adz 359
lashing of house parts 25, 28, 30, 34 37, 38, 40, 41, 42, 43, 53, 57
latu 27, 85, 87
lau 106, 217, 514
lau alofa 125
lau fasa 60, 83
lau lama 556
lau maile 628, 630
laua 534
lau'a 292, 308
lau'a tasi 294, 307, 312
lau'a'a 99, 300, 315, 359, 439
Lauao-oTuiatua 319
laufa 571
laufa'i 106
laufala 211, 212, 216, 545, 548, 549
laufao 102, 113, 556
laufono 381
laui'e 76, 211, 213, 225, 226, 256, 266 274, 275, 545, 549
laulalo 381
laulau 80, 124, 139, 182, 183, 184, 186, 200, 216, 559, 562
laulautasi 76, 93, 142
laulautu 70
lauloa 444, 446, 476, 483, 486, 517
laulua 381, 390
laumapapa 129
laumea 616
laumei 123
launga papa 443
launiu 168, 503, 506
Lauofo 492
lauo'o 548
laupaongo 211, 212, 214, 545, 549
laupola 60, 169, 182, 433
laupolapola 172, 182
lausae 645, 651
lauta 488
lautalinga 583, 601
lautasi 67, 217
lautele 472
Lauti 369
lauti 'ula 253
lauu'a 292, 294, 412, 556, 616, 618, 630
lauulu 622
lauva'a 381

PAGE

lauvae ... 529
lavai ... 120, 123
lavalava ... 138, 312, 316, 444
lavata'i ... 91
lavatasi ... 26
lave ... 615, 616, 617, 618, 619, 627, 666
lave lau ... 62
lavelei ... 514
laveuli ... 514
Le Afine-vave ... 443
Le Fale-o-le-fe'e ... (See Fale-o-le-fe'e)
Le Fee (See also fe'e) ... 573, 613
Le Foanga ... 332
Le Foanga-o-Lae ... 332
Le Ifi ... 85
Le Lafonga ... 147
Le Malama ... 83, 85, 86
Le Malu ... 486, 522
Le Oso (See Ripley)
Le Pola ... 100
Le Polo ... 138
Le Ulumoenga ... 573
leaf cover ... 102
legend of fe'e and rat ... 438
lei ... 68, 497, 629
le'i ... 358, 361
lelenga ... 291, 296
lelepa ... 492
lemon ... 128
lenga ... 111, 135, 297, 299, 300
lepamaile ... 423
Lethrinus reticulatus ... 445
leu tasi ... 333
Leutongitupaitea ... 103
li ... 371, 377, 397, 398
Lia ... 93
lighting ... 74
Lila ... 558, 559
lima ... 548
lime ... 520, 620
lime bleaching ... 616
lime juice ... 124, 128
limu ... 136
line ... 513
Linton ... 661, 662, 663, 664, 665, 668, 670, 671, 672, 674, 675, 676, 677, 678
lipi ... 613
Lisonbee, J. L ... 445
liu ... 106, 373
Liufau ... 564
livaliva ... 495
lizard ... 559, 567
lo ... 419, 445, 463
loa ... 297, 299, 306
lobster pot ... 447, 449, 454, 455
loi fa'i ... 134
loi ufi ... 133
loiloi ... 547
loin cloth ... 312
lolo ... 620
loloi ... 129, 135

PAGE

loloi ufi ... 133
lomi ... 104, 134
lomilomi ... 104
lona fa'apona ... 500
London Missionary Society ... 93
longo ... 85, 575, 577, 581, 582
lopa seed ... 628
Lorius solitarius ... 281
Losi ... 551
lou'ulu ... 116
lu ... 128, 131
lua'i ... 132, 547
Lua-le-manga ... 564
Luamaa ... 329
Luanga ... 32, 38, 83, 85
lu'au ... 130
lu'au fui ... 131
lucky hook ... 510
lufa ... 306
lunga ... 499
lupe ... 526, 532
lupeo'atoa ... 540
lupeofanoloa ... 540
lupeomanu ... 540
lupeopupula ... 540
lulu'u ... 661
lure ... 434
lutu ... 423

M

ma'a ... 418, 419, 523, 550
ma'a ala ... 101
ma'a fa'amata to'i ... 332
ma'a ta'i fe'e ... 434
ma'a tamea ... 620
ma'a tu ... 463
ma'a umu ... 101
ma'afa'amalie ... 369
ma'afala ... 550, 565
ma'ali ... 533
ma'alo ... 124
ma'ata ... 608
mace club ... 589
maea (Maori) ... 233
maea fili tolu ... 246
maea fu'a lua ... 245
maea noa malie ... 246, 422
maea sisi ... 412
maea tua lima ... 247
maene ... 474
mafaufau ... 643, 654
Mafui'e ... 99
mafuna ... 163
maga ... 495
mahimahi (Tahiti) ... 676
Mahuika (Maori) ... 98
maile ... 124, 125, 126, 412, 551, 628
maile lau li'i ... 550
mailei ... 676
mailei 'iole ... 524
mailei moa ... 527

PAGE
mailei pua'a 525
mailo 144, 182, 183
ma'ilo 183
maiufi 425
makaloa (Hawaii) 668
malae 70, 370, 451, 573
malai 517
malaise 236
Malama 83, 85, 86
malanga 6, 122, 146, 156, 322
malanga fanga 520
malasina 111, 135, 137, 300
malau 463
malauli 421, 445, 488, 490, 491, 514, 522
malava 445
Malay apple 304
male'i 463
malie 422
Malietoa 70, 100, 127, 140, 407, 588, 589
Malietoa-fua-o-le-toelau 543
Malietoa Laupepa 319
malili 406, 533
mallet....236, 364
malo 312, 668
Malo-le-foua 159
malolo 427, 475
malolonga 539, 544
malu 486, 522, 636, 656, 658
malumalu-o-le-aitu 70
mama lupe 533, 546
mamala 132, 640
mamanu 31, 180, 228, 306
mameloa 533
man as food 127
manaia 6, 361, 581, 615
manaui 413, 533, 539
manevenave 486
manga 495, 499
manga lua 529
manga mate 401
mangeo 285, 303, 309
mangingi 482
mango 443
mangrove 434
Mani-laulau 533
manini 419
manoa 232, 233
manu 24, 400, 506
manu fonua 529, 534
manu tafi manu 529
manu tafili 538
manu tele 143
manu vao 529, 534
manu'a 550
manuali'i 551
Manufili 83, 85
manuia 155
manulenga 427, 533
manuo 526
manutangi 526, 529
ma'o 476

PAGE
Mao ma Uli 613
maopo 132, 144, 550
ma'opu 132
marae (Maori) 370
marae (Tahiti) 370, 613, 670
maro 312
Marquandt 650, 655, 658
marriage 317
marriage gift 81
mase 550
masi 104, 132
masi afifi 132
masi fa'i 134
masi palu 132
masi penu 132, 136
masi tao 'ato 132
masi, tradition of 132
masimasi 404, 423, 492, 493, 494, 676
masina 212
masoa 108, 111, 135, 293, 548
mast 410, 414
Mason, Otis 208
mat....80, 209, 211, 319, 667
mat collecting custom 75
mat cone (fishing) 430
mat, floor 75, 216
mat ornamentation 281
mat roll drum 574
mat storage 80
mat, wall 73
mata 105, 128, 150, 459, 470, 496
mata lafi 416
mata-o-le-i'a 522
mata paongo 491
mata Sasaumani 475
mata si'a 99
matau tuna 492
Mata'afa 83
mata'ele'ele 445
mata'upenga 470
mata'upenga a Sasaumani 472
matai 85, 121, 142, 147, 640
matai afo 513
matai'a 236
matalafi 357, 358, 628
matalau 517
matamosimosi 628
matamu 517
matanau 546
matangi 274
matau 330, 490, 494, 534
matau fa'ato'elau 493
matau la'au 489
matau tuna 491
matavana 496
mati 231, 533
matiata 231, 234, 235, 486
matila 404, 504, 506
matimati 423
matira (Maori) 506
matofi 237, 631

PAGE
matu 477, 486
matua 30
'Mau o 566
Mauava 564
Maui 568
Maui-tikitiki-o-Taranga (Maori) 98
Mauia 568
Maunga 70, 322
maunu 284, 443, 541
maunu seu 487
maunu tau 487
maunu tau lafo 424
maunu tautino 426
maunu tafea 425
McKern, W. C. 4
mea 146
mea fono 120, 122
meals 137
Mead, Margaret 225, 226
megalithic ruin 324
meleki 333
mele'i 115, 333, 517
mesh gage 470
metal hook 515
Meto 68
Meto-tangi-vale 65
Meyer, A. G. 445, 446
Micronesian influence 661
Mikaio 631
military exercise 570
milo 106, 232, 233, 234, 237, 375, 377 413, 439
mincer 114
mingimingi 616
Misa 26, 27, 32, 43, 91, 92
miti 128
moa 122, 527, 553
moa fa'i 628
moa vao 527
moamoa 50, 86, 552
Moe 85
moemoe 130, 169, 633
moenga 563
moengalo 134
moli 74
moli lama 75
moli u'u 565
mona 570
mongamonga 560
monumental cairns 322
mo'o 567
moon phases 540
Morinda citrifolia 304
Moso 613
mosooi 372, 563, 577, 628
mosquito curtain 79
motumotu 99
mouth flute 677
mu pangoa 443
mua 568
mui'a'a 236, 237

PAGE
muli 104, 121, 128, 150, 432, 451, 459 476, 483, 487, 553, 640
Muli-maunga 321
muli tuitui 507
mullet 439, 484, 485, 486, 522
mullet fishing 615
mullet hand net 478
mullet netting 520
Mulloides vanicolensis 445
mumu 236, 477, 490, 491
mumu'a 236
mumuta 620
Muraena 422
Musa sp. 303
mushroom club 601
musical instrument 574, 677
musoi 533
mutalau 463
Mytilus sp. 277

N

na'a 536
nafa 572, 576, 577, 580, 581, 678
Nafanua 275, 551, 660
naiaso 425
Nai-saafa 65
naiufi 520, 521
namu 79, 620
Nano 150
naonao 418
nau 253
Nautilus pompilius 618
navel 653
Navigator Islands 417, 509
necklace 628
needle 168
needle, thatching 62
Nelitris vitiensis 628
Nelson, O. F. 492
Nereis 440
net 428, 469, 526, 676
net float 473
net sinker 474
netting material 470
netting needle 470, 676
netting platform 534
netting seat 535
netting technique 470
ngafa 240, 578
ngalongia 518
Ngangamoe 70
nga'o 523
ngatae 313, 628
ngatala 463, 517
ngatu 99
ngongo 526, 541, 552, 642
ngungu 299
nguti 104, 113
ngutinguti 113
ngutu 451
nifo 594, 595, 605

PAGE
nifo'oti 145, 603, 604, 605
niu 128, 550
niu 'afa 235
niu alava 236
niu aleale 527
niu mafiafia 564
niu malo 236
niu sasa 236
niu sina 570, 571
niu tolo 129, 136, 144
niu ui 235
niu uto 427
niu vao 497, 579
niufafo 39
niukini 548
noa 160, 253
nofoanga 327, 399
nofoanga seu lupe 535
nono 125, 306
nono (Cook) 304
nonu dye 306
nonu fi'afi'a 304
noosing shark 426
Nordhoff 676
nose flute 582, 678, 679
notanga 502
Nua 92
nuanga 299, 301
nu'anu'a 628
Nuu 490, 522

O

oa 374, 390, 406
'o'a, 99, 115, 120, 264, 274, 294, 297, 303, 304, 306, 312, 438, 620
o'ai 306
octopus 420, 436
octopus stone house 613
'ofe 76, 105, 285, 503, 575, 581
official sharing 125, 126
ofu 104, 120
'ofu 130, 132, 249
ofu valevale 120
ohe kapala (Hawaii) 305
ohini (Cook) 205
oini (Tahitian) 205
ola 189, 228, 432, 441, 517, 539
ola 'ave vai 202
ola fangota 202, 208
ola o le laulua 381
ola malu 195, 418, 420, 447
ola tu 195, 198, 418, 419, 517
ola tu ngata 523
olamea 115
olaolatina 362
olasina 570, 577
oli 572, 628
olioli 491, 502, 530
olo 104, 111, 152, 331
'olo 322, 606, 609
oloa 317

PAGE
'oloa 87
ololua 333
olonga 330, 331
oloolo 135, 444
olosina 439
ongaumu 100
o'o 121
o'omi 104, 134
orator's fly switch 283
orator's staff 607
orange 565
orange leaves 620
origin of builders 84
origin of cultivated plants 551
origin of fire 98
origin of ingana 443
origin of kava 147
origin of pula'au taro 533
origin of red-lipped mullet 485
origin of Samoan house 82
origin of tattooing 658
ornamental lashing 31
os ilium 636
oso 545
oso to 545, 552
oso to tiapula 547
otai 136
oti 605
oto 615
'otu 'otu 294
outrigger 371, 375, 674
outrigger boom 392
outrigger float 393
oven 100
oven spreader 108
oven tongs 109
Ovula 404
ovula shell 392
Ovulum 401

P

pa 208, 432, 492, 494
pa ala 234, 372, 494, 510, 511, 513, 514, 515
pa aloalo 516
pa foafoa 579
pa i'a 444
pa i'u 567
pa lanulua 498
pa laumilo 494, 498
pa lauti 514
pa lautofe 494, 498
pa lupovai 498
pa maunu 494, 498
pa no'ono 494, 498
pa pua'a 119, 323
pa seuseu 494, 514, 516
pa sulu 494, 498
pa tangi 494, 497
pa taua 322
pa tio 498
pa ulia 494, 498

PAGE
pa usi....494, 498
pa'a 126
pa'anga 253
pa'atu....234, 294, 497
paddle 413
paddle club....584, 596
pae 138, 285, 286, 539
pae le umu.... 101
pae'aso 38, 39, 84
paepae....56, 66, 141, 327
pa'e pa'e....236, 276
pa'i tele 443
painting bark cloth....304, 306
paito 69
pala'au....70, 510, 511, 514
palai 546
palalau 534
pale....381, 383, 615
pale fuiono....616, 619
palepoi 82
paleta 82
palette for pigment.... 640
palolo 418, 439
palolo night 440
palolo scoop 439
palu 104
palu sami 104, 108, 129, 131, 137, 138, 143
pandanus 212, 489, 545, 549, 628, 633
pandanus fruit....583, 589
pandanus fruit brush.... 307
pandanus leaf basket.... 205
pandanus leaf fan.... 633
pandnaus leaf kilt.... 256
pandanus leaf preparation 212
pandanus leaf whistle.... 580
pandanus mat....211, 563, 564, 574
Pandanus saviensis 212
Pandanus tectorius 212
Pandanus tectorius var. laevis.... 212
Pandanus whitmeeanus 211
Pandanus upoluensis 212
panga 565, 567
panga lua 567
panga ti'a 566
pangea 628
pangi 427, 438
pangiuto 427
pani 304, 306
Pan's pipes....580, 581, 678
pao 556
paongo....206, 211, 214, 306, 308
paono 211
pa'o'o....296, 425, 434
paopao....299, 369, 371, 372, 373, 414, 419, 453, 484, 514, 517, 553
paopao paddle 413
papa 75, 211, 214, 294, 306, 441
papa elei 308
papa fai u'a.... 285
papa valu 293
papa valu lau'ie.... 277

PAGE
papaia 135
papaongo 372
paper mulberry, 231, 283, 470, 545, 549, 563, 570, 573, 669
parrakeet....256, 281, 526, 527
pareu (Cook) 304
Parinarium 620
Parinarium insularum 628
pata 403
patangaloa 517
patches 403, 404
patching siapo 293
pate....575, 576, 581, 582
pate (Tahiti) 678
pattern 180
pau....284, 288, 485, 530, 583, 606, 608, 622
pa'u 447
pa'u fao 486
pa'u pito i totonu.... 284
pa'u pito i tua.... 284
pa'u tolo 313
pa'umasumu 520
pa'usisi 65
Pava....131, 147, 155, 332
paved roads 321
payment for canoe.... 415
payment for tattooing.... 661
pe'a 526
pearl shell....495, 498, 510
peelers 109
pe'epe'e....105, 113, 123, 128, 313, 323
peg 80
peg lashing 675
pelvis bone 636
penga 103
penu 110, 113
penu penu 421
pepe 65, 223
Perna 498
Perna costellata 510
personal adornment 615
Phaeton rubricauda 616
Phaloria burnettianes 628
phases of the moon.... 540
pi 313
pia 548
piasua....100, 104, 115, 135, 137, 138
piato 13
pig....119, 542, 641, 676
pig, ceremonial division 121
pig excluded from houses.... 80
pig trap 525
pig wall....321, 323
pig, wild 524
pigeon....123, 526, 532, 542
pigeon food 533
pigeon flying 556
pigeon netting....532, 540, 544, 677
pigeon netting platform.... 321
pigment for tattooing.... 640
pigment mortar 640

PAGE

pi'ipi'i ... 616
Pili ... 469, 546, 552, 631
pili me'ime'i (string figure) ... 559
pillows ... 76
Piper methysticum ... 147, 548
pipi ... 285, 287, 299, 372, 523, 533, 628
Pipturus propinquus ... 231, 293
plaiting ... 164, 216, 667
plaiting customs ... 247
plaiting kilt ... 257
plaiting material ... 168
plaiting parties ... 248
plaiting sennit ... 237
plaiting terminology ... 165
plaiting house ... 320
plantain ... 134, 135
planting stick ... 545
platter ... 139, 182
plover ... 438
Plumeria ... 628
po ... 103
'po ... 299
Poeausi ... 382
poi ... 104, 105, 134, 138, 630
poi pounder ... 113
Poina ... 558
pointed stake defence ... 609
poisoning fish ... 112, 443, 513, 676
pola ... 73, 100, 181, 209, 299
pola sisi ... 74, 176, 181
pola taufafo ... 181
pola taufale ... 182, 209
polani ... 182
polava'a ... 182
polavai ... 75, 182, 209
polo ... 103, 138, 628
poloite ... 628
polygamy ... 69
Polynemus phlebejus ... 445
Polynesian dialects ... 4
Polynesian dog ... 127
Polynesian race ... 4
pona ... 76
poncho ... 313
ponge ... 463
pongipongi ... 162
popo ... 75, 236
population of Samoa ... 3
Porphyrio samoensis ... 551
post raising ceremony ... 91
potoa ... 131
pottery ... 100
potu ... 79, 312
pou ... 618
pou fale ... 409
pou fesisi ... 58
pou lalo ... 44, 56
pou 'ofe ... 392, 506
pou tu ... 83, 328
poua ... 84
poula ... 251, 574, 581, 630

PAGE

poumuli ... 115, 393, 403
pounders ... 111, 137
popo ... 128
pousina ('ulu) ... 550
poututono ('ulu) ... 550
povai ... 588
Pratt, 105, 115, 119, 126, 130, 132, 182, 206, 211, 249, 250, 253, 281, 282, 287, 292, 293, 304, 306 312, 333, 364, 414, 427, 428, 436, 470, 482, 492, 497, 508, 522, 531, 540, 548, 569, 571, 576, 578, 607, 616, 655
Pritchard, 295, 296, 304, 305, 324, 326, 328, 493, 536
prohibitions ... 551
prohibitions in turmeric making ... 302
prompting kava distribution ... 158
property ... 80
propritiatory rocks ... 329
protection of house ... 82
pu ... 451, 578, 582
pu fangota ... 391, 416
pu faofao ... 579
pua ... 628
pua (Cook) ... 663
pua palolo ... 441
pu'a ... 527, 628
pua'a ... 119
pua'a fata ... 141
pualulu ... 76, 114, 628
puapua ... 533
puapua'i ... 450, 452
pu'e ... 322
pu'enga ... 400, 506
puke ... 568
puketa ... 569
pula tele ... 644, 645
pula'au ... 533
pulatama ... 645
pule, 126, 145, 374, 401, 406, 474, 480, 628, 673
pule fafa ... 435
pule fao ... 436
pule ta'i fe'e ... 434
pulei ... 38
pulenu'u ... 579
pulotu ... 580
pulou lau fa'i ... 615
pulou 'ulu ... 204, 247
pulu ... 114, 128, 307, 315, 316, 621
pulu float ... 453
pulu ta'ele ... 620
Pulu-seu ... 533
Punga ... 65, 233, 565
pungialo ... 655
puni ... 433, 455
puni loa ... 434
puni mata tongo ... 434
puni u'a ... 292
punialo ... 646, 652, 653, 655

Page
puou 389, 550
pupu lama 303, 640
pupu 'o'a 306
pupuni 79, 312
purple dye 303
purlins 31, 32, 38
pusa 101
pusi 422
pute 653

Q

quarry 330

R

rafter 29
rafter joins 36
rail 438, 526, 532
rakau takiri pahoa (Cook) 305
rank shown by clothing 316
rat 438, 524, 541
rat carpenter (legend) 65
rat guard 80
rat trap 524, 676
rattle for shark 423
recreation 552
red earth 380, 385
red earth dye 303
refuge 609
Reinecke 212
religious objects 613
religious structures 670
relish 138
reverse hafting 362
rhinoceros beetle 579
riband (ribbon) 622
ridgepole 27, 35, 50
ridgepole end piece 50
ridging sheet 174, 175
rigging of canoe 412
right angled plaiting 225
Ripley 21, 108, 246, 319, 332, 482, 510
Ripley, Fepuleai, 6, 121, 163, 319, 427, 428, 499
Ripley, Le Oso 83, 151, 428, 499
Rivers and Haddon 557
roads 323
rod, fishing 503
rod rest 377
rolling sennit strand 237
roof 60
roof ridging sheet 174
Roogevein 532
rootstock club 588
rope 79, 231, 233, 245, 473
Roth, Ling 669
rubbing 308
rubbing designs on bark cloth 306
rubbing stone 495
ruin, prehistoric 328
ruling on bark cloth 305
Ruvettus 493, 676

S

Page
sa 140
Sa Tangaloa 83, 84, 86, 414, 680
sa'afa 236
sa'ana 520
sa'asa'a 155
sacred objects 613
sae u'a 284
sae'e 476
saemutu 654, 655
sa'cu 115
safa'ausu 522
sai fa'i 134
sai maku 655
sail 380, 404, 410, 675
saitamu 583
sake 581
sala 447, 452
salatau 463
salinga 253
salt 138
salu 81, 442
salu lima 81
salu pungaleveleve 82
salu tu 81
salue 392, 401
sama 385
samala la'au 364
sami 128
sami lolo 129
Samoa, administration 3
Samoa, geography 3
Samoa, language 4
Samoa, population 3
Samoan grammar and dictionary 4
Samoan villages 5
Samonga 158
sandals 313
Sanga 552, 631
sangaio 480
sangamua 123
sangamuli 123
sangasanga 550, 628
Sao 85
sao fai fe'e 420
sapinc 212
sapo 553
sapoliu 520
sasa lapalapa 581
sasa pulu 236
sasa'a 156
sasae 101, 108, 284
Sasaumani 522
sasanga 72
Satele 162
sauali'i 531
sauauli 323
sa'ula 508
Sauluanga 83
sausau 639
savalinga 253

	Page
savili	274
sawfish	509
scaffolding	24, 48
scarecrow	551
scarring	658
Schultz, Dr. E., 444, 445, 532, 541, 564, 566, 571	
scoop net	432, 439, 476
scraper	109
scraper, stone	368
scraping board	277, 285
screen	73, 175
sea	628
sea centipede	420
sea eel	422, 443
sea eel trap	447, 466
sea shell	628
sea voyage	417
seam batten	674
seasea	628
seating	156
seat	666
seat, stone	321
seaweed	136
se'e vae	313
se'e vae fau	315
se'e vae lau'a'a	315
se'e vae pulu	316
seed anklet	630
seed flicks	115
seed necklace	628
se'ese'e	253
sei	622
se'i	477, 486, 553
sei milamila	622
seine net	283, 482
sele	109, 420, 527
sele fatu	109
sele malauli	421
sele pusi	422
sele ta	333
sele ula'	422
sele valo	420
selu	616, 622
selu pau	627
selu tuaniu	622
selu tuinga	622, 625, 627
sema	306
senga	499, 502, 526
sennit	631
sennit basket	207
sennit braid net	470
sennit grater	111
sennit three-ply braid	235
sennit two-ply cord	233
Setchell	211
seu	478, 538, 542, 567
seu a lunga	526, 539
seu lalo	537
seu lupe	526, 532
seu ngongo	541

	Page
seu pe'a	526
seu'anae	478, 484
seuseu	234, 514, 516
shaggy garment	266, 273, 668, 679
sham fight	573
shark	124, 443, 522
shark club	427
shark fishing	492, 520
shark hook	676
shark net	423, 486
shark noose	246, 422, 426
shark rattle	423
shark rope	246
shark spear	427
shelf	71
shell adz	353
shell forceps	621
shell necklace	628
shell ornamentation of canoe	401
shell scraper	277, 285
shell sinker	474
shell stand	392
shell trumpet	677
shellfish	517
shrimp net	479
si niu	422
si'a	470
si'a afi	99
siapo,	140, 145, 249, 282, 312, 320, 615, 640
siapo fa'aasu	313
siapo mamanu	306, 307
siapo tutusi	306
sifa	459
si'i	217
si'ita	572
silinga	505, 520
silo	125
Sina, 128, 132, 419, 422, 443, 485, 514, 522, 546	
Sina-mata-imoa	65
Sina Sasaumani	470
Sina, seat of	328
Sina-vai-o-le-malama	533
singango	212
singano	628
Singi	85
sinker	369, 474
sipa	475
sisi	128
sisi tai	628
sisi vai	628
sisi vao	628
sisili	299, 302
si'u ola	195, 199, 202
si'usi'u	124, 437
siva	145, 497, 574, 620, 630
siva-a-'ofe	581
siva kilt	581
Skinner, H. D.	333, 666, 674
skipjack snare	421

PAGE

skipping rope 552, 573
sleeping mat 8, 76, 216
sleeping room 79
sliding 552
sling 608
sling stone 608
Smith 406
smoked bark cloth 313
snakes 523
snare 420, 527, 542
snood 495, 499, 512
snood attachment 505
so'a 32, 39, 71, 87
soa'a 134, 135, 206, 216, 229, 303, 549
soa'a oloolo 137
So'a-fa 83, 85
soap 273, 619
soatau 322, 371, 377, 378
social influence 541, 543
social value of community games 573
society trade mark 86
sofesofe 133
Solanum 628
solinga 31
solo 564, 640
Solofuti 85
song of Hiro 673
songa 621
soni 105
so'o 189, 190, 423
so'o mata sai 55
so'onga 238, 240
so'oso'o 119
soso'a 104
sosofa 136
sound instrument 580
sounding board 580, 581
spear 427, 570, 573, 606
spear throwing 566, 570
sperm whale teeth 613
spirit house 70
Spondylus ducalis 510
sport 541, 542
squid 126, 517
squid lure 434
squid lure sinker 369
Squilla 421
staff 631
Stair, 70, 126, 127, 282, 303, 312, 324, 326, 328, 407, 409, 415, 417, 513, 573, 578, 579, 580, 581, 621, 660, 661
stamping or printing bark cloth 305
standard of value 319
star fish 657
steering paddle 412
steering seat 399
Stehlin, E. Jr. 6, 162, 656
stern cover of canoe 392
Sterndale, Handley Bathurst 328
Sterndale, R. A. 328
stilts 552, 573, 677

PAGE

Stokes, J. F. G. 333, 444
stone adz 670
stone anvil for kava 152
stone breaking 330
stone coconut grater 367
stone house 324
stone knives and scrapers 368
stone mat and curtain weight 79
stone road 323
stone seat 321
stone sinker 474
stone structure 678, 679
stonework 321, 670
storage basket 206
store house 70
strainer 113
strainer for kava 151
stranger's post 146
string figure 557
sua 128, 140, 141, 320
Sua 444
sua fa'i 134
sua esi 135
sua palusami 131
sua ta'i 140, 142
Suai-fonua 283
suapeau 123
suati 378, 404, 405
suavai 96, 140
sugar 133
sugar cane 136, 313, 545, 548
su'i 139, 609
su'i lua 177
sui tolo 129
sulasula 549
Sullivan 4
sulu 251
sulu panga 567
sulumo'o 567
sulunga titi 251
sumalie 520
sumu 41, 228, 478
sungalo 143
sungalupe 517
suni 566, 628
surf board 573, 677
surf riding 553
susu 161
susu'i 64
susunga 161
su'u laulau 141
sweep, fishing 430
sweet potato 133, 545, 548
swing 552, 573

T

ta 286, 331, 567, 572
ta tatau 636
ta'a 232, 499
ta'a paepae 143
ta'afi 640

PAGE
ta'ai 105, 242
ta'ainga 213, 450
ta'alolo 143, 283
ta'amu 102, 103, 129, 548
ta'amu talo 109
Tacca pinnatifida 135, 548
tae 236
ta'e 128
tae i'a 129
ta'ele 381, 619
taelama 126
Taema 204, 658, 660
Taema myth 204
Tae-o-Tangaloa 147
taepa 440
tafani 645, 654, 655
tafau 565
tafili 538
tafolo 550
tafua 238, 574
tafua le fala 575
tafue 552
ta'i namu 312
tai taeao 523
taiao 430
ta'inamu 79
ta'ingafi 74
taisi 129
taisi ufi 133
taiulu 430
takurua (Cook) 678
tala 48, 291, 592, 594
tala ('ulu) 550
talafale 121
talafalu 476
talama 307
talanga 520
talaua'au 483
talava 31
talavalu 592
tala-o-le-lo 608
tali masanga 423
tali matangi 82
tali tata 382, 414, 508
talie 382, 533, 577
talinga 144
talita 573
talitali 71
talitu 648, 650
talo, 104, 129, 137, 138, 146, 529, 533, 545, 546
talo fa'ataisi 129
talo leaf 130, 640
talo mangasiva 546
talo manu'a 546
talo niue 546
talo pa'ia 145
talo pala'au 546
talo pounding 112
talo taisi 137, 141
talo tao 129
talo tanga 546

PAGE
talo tasi 140
talo taufolo 113
talo valuvalu 137
taloa 307, 312, 381
talu 566
tama sa 318
tamanu 372
Tamasese 588
taneuli 108
tanga 125, 206, 225, 330
tanga te'a 369
tanga ti'a 566, 569
tangafa 578
Tangaloa 131, 332, 414, 680
Tangaloa-langi 132
Tangaloa-matua 24, 82
Tangaloa period 147
Tangaloa-tea 145
Tangaloa-ufi-nu'u 486
Tangaloa-ui 147, 155, 329, 470, 472
tanganga 380
tangatanga 105, 427
Tangavai-lenga 85
tangi 497
tangi le lenga 302
tangi to'ia 529
Tangiia (Cook) 673
Tangoai 443, 522
tanifa 487, 488
tanoa 106, 108
tanoa 'ava 148
tanoa masoa 135
Tantania 628
tanufale 82
tao 104, 122, 135, 137, 438, 606
tao 'api 463
tao fofoe 134
tao fuifui 439
tao mata tasi 438
tao mata tolu 438
tao valu fua 607
taolafo 63
taomanga 236
Tao-nei 151
taosala 571
ta'oto 550
taotuaniu 63
taova'a 427
tapa 154
tapa (Maori) 282
tapa (Tahiti) 282
tapa, see also siapo
tapa'au 75, 209
tapa'au vai 209
tapalenga 555, 568, 677
tapapanga 291
tapapanga u'a 287
tapati 157
tapito 207, 225
tapolo 573
tapongo 570

	Page
tapua	458
tapu'e	548
tapui	550, 551
tapula'a	567
tapulu	645, 655
taputo'i	533
tapu'u	566, 569
target	570
taro, see also talo	677
tasali	566, 567
tata	306, 307, 309, 311, 414
Tatanga-matau	330
tatao	388, 399
tatao o le tumatua	381
tatau	104, 113, 635
tatavale	572
tateme	495, 497
tati'a	566
tattooing	6, 635
tattooing artist	679
tatooing implement	636
tattooing mallet	639
tattooing motif	641
tau	102, 383, 391
tau vela	102
tau veve	102
taualunga	64, 174
tauanga	104, 113, 114, 128, 137
taufale	22, 87, 90
Taufale Ali'i	88
taufi	101
taufolo	67, 100, 103, 105, 108, 109, 115, 137, 144, 630
taufolo niu	132
taufolo pounding	112
taufolo sami	132
taufolo talo	130
taufolo 'ulu	131, 132
ta'ui	80, 242
ta'ui 'afa	243
Tau-i-iliili	103
taula	233, 369, 414, 487
taulanga	401
taulanga laufala	212
taulangi	156
taulalo	158, 573
taulima	630
taulua	105
taumafa	158
Tau-mariari (Society)	673
taumata	231, 537
taumata eye shade	520
taume	428, 443
taumua	383
taumualua	371, 405, 417, 673
taumuli	381, 383
taunga	142
taunga au moe	142
taunga i alaalafanga	142
taunga i le aualuma	142
taunga i ma'i	142
taunga laloa	252
taunga loloa	252
taupenga	552
taupou	6, 75, 121, 125, 143, 153, 316, 615
taura (Maori)	233
Tausala	282
tauso'anga	43, 97
tautai	124, 495, 517, 518, 521, 582
tautala	227
tautau	520
tautau 'upenga	485
tautaulanga	484
tautaunga	80, 88
tautu	381
tauvae	533, 538, 630
tava	413
tava'e'ula	616
tavai	533, 539
tavasanga	567
Te Rangi Hiroa (Maori)	155
Tea	132
te'a	369, 565, 566, 663
te'a (Society)	565
te'a muli	566
te'anga	565
teetotum	553, 573
teka (Maori, Cook)	565
teka (Tahiti)	566
tele	520
temeteme	497
temple	70, 613
Tephrosia piscatoria	444
Terebra	381
tern	123, 526, 642
tern netting	541
terrace, house	67
terrace irrigation	677
territorial relationship of culture	665
teuila	628
textile kilt	259
textile plants	549
thatch material	60
thatch rafter	35
thatch sheet	169
thatch trimming	65
thatching	62, 63
thatching needle	62
thatching paddle	64
thread	233
throwing club	584, 606
throwing cord	664
throwing disc	369
ti	136, 545, 548, 579
ti fangasa	250
ti fonua	250
ti leaf	630, 668
ti leaf kilt	520
ti leaf whistle	580
ti manu ali'i	136
ti palea	251

PAGE

ti pala'au ... 251
ti root ... 313
ti tau 'ava ... 151
ti tongotongo ... 250
ti usi ... 251
ti vai ... 136
ti, varieties ... 250
tia ... 322, 328, 330, 331, 526, 539
ti'a ... 565, 566, 570
tia seu a lunga ... 539
tia seu lupe ... 321, 534
ti'a tafau ... 569
ti'a ulu afe ... 567
ti'a ulu manu ... 567
ti'a ulu tofu ... 567
ti'a ulu tonu ... 567
tiapula ... 547, 551
Tiitii-o-Talanga ... 99
tila ... 414, 676
tila lalo ... 411
Tilafainga ... 658, 660
tilatu ... 411, 412
tili tongi ... 482
tilo lo ... 419
timata ... 473
Timu ... 162, 319, 571
tina ... 386, 416
tingi ... 555
Tingilau ... 68
tino ... 520
tinolua ... 520
tin ... 575
tio ... 498
tipi ... 103
tipola ... 134
tiputa ... 313
tira (Polynesian) ... 414
titi ... 316, 485, 548
titi fa'ale'a'u ... 251
titi fa'atuso'o ... 251, 252
titi fala ... 256
titi fangai'o ... 249
titi fatu ... 254, 257
titi fau ... 249, 253, 255
titi fili ... 254, 256
titi fonua ... 253
titi kilt ... 249
titi lauti ... 249, 251, 252
titi mangumangu ... 253
titi pala ... 253
titi pa'upa'u ... 253
titi se'e se'e ... 253
titi tongotongo ... 253
titi 'ula ... 249, 253, 256, 610
title, kava cup ... 158
ti'ula ... 250
tiunga ... 492
tiunga malie ... 492, 493
tiunga masimasi ... 492
To ... 85
to fa'asoata, ... 14

PAGE

to sunu'i ... 13, 665
to tau ava ... 114, 151
to tau lolo ... 620
to tau'o'a ... 297
toa ... 288, 395, 438, 566, 583
toadstool ... 601
Toaloa ... 486, 522
to'anga o le taeao ... 537
toboggan ... 553, 573
to'e 'ai ... 564
to'elau ... 133, 493
Toelupe ... 571
tofa umu ... 101, 108
tofaso ... 99
tofi ... 104, 115, 364
toi ... 99, 287, 356, 620
to'i ... 114, 330, 332
to'i fafao ... 359
to'i fatu ... 333
to'i fau tonu ... 332
to'i laitiiti ... 332, 362
to'i lau ... 332
to'i ololua ... 333
to'i pito tele ... 362
to'i pua ... 104, 114, 131
to'i sila ... 332
to'i tele ... 332
to'i'ulu ... 114
to'i vete ... 333
Tokelau basket ... 205
tolo ... 60, 104, 115, 129, 136, 546, 548, 570
tolo matu ... 477, 484, 485, 486
tolo taufolo ... 137
tolonga ... 566, 570
tolovae ... 474
Tolufale ... 552
toluse ... 658
tomotomo ... 410, 412
tonga ... 317, 320, 548
tongi ... 553, 590, 610
tongitongi ... 590, 610
tongs ... 101, 109
Tonna ... 109
to'o ... 492
to'o loto ... 27
toothed club ... 584
to'oto'o ... 93, 143, 606, 631
to'oto'o ali'i ... 241, 248
to'otu ... 80
top ... 553, 573
torch fishing ... 428, 475
toso ... 493
totosi ... 213, 217
tou ... 293, 473
to'u ... 333
towel ... 640
toy ... 552
trade mark of builder ... 86
tradition of first masi ... 132
tradition of unfinished thatch ... 65
trap ... 524, 527, 542, 676

PAGE

tree fern 491
tree platform 539
Trentis 445
Triton 677
triton shell trumpet 579
Trochus 649, 650, 652
Trochus niloticus 610, 642
trolling hook 494, 510
trolling hook basket 208
tropic bird 616
trumpet 578, 582
trumpet shell 613
tu ava ava 482
tua 123, 168, 232, 275, 552
tua pulu 236, 237
tuafanga 434, 447, 458, 463
tuai 104, 110, 113, 128
tuai ma'a 367
tuala 121, 141
tualua 253
tuanga 392
tuaniu 75, 168, 302, 490
tuaoloa 133
tuapipi 284
tuatua 128, 302, 616, 622
tu'au 503
tufa 489
tufaanga 143
tufaanga sa tui atua 519
Tufele 6, 23, 68, 92, 93, 520
Tufou 658, 660
tufuga 87
tufunga 84, 207
tufunga muamua 83
tufunga ta tatau 636
tufunga usu 92
tug-of-war 552
tu'i 104, 430, 522
tui atua 519
tu'i ipu 423
tui laufala 212
Tui Manua 56, 70, 150, 158, 163, 402, 522
Tuiafono 486
tui'itu'i 104, 110, 134, 236, 371, 375, 394, 419, 575, 620
tu'itu'i amu 419, 483
tuinga 81, 145, 532, 615, 619, 622, 669
tuinga lauulu 615
tuingalama 429
Tuitele 6, 70, 143, 150, 159, 160, 200, 202, 226, 331
tula 533, 538
tulafale 86, 121, 445, 660
tulafale ali'i 145
tulafana 410, 412
Tulanga-a-Sasavai 573
tulanga vae 389
tulangongo 426
tuli 438
tulialo 519
tuluma 639

PAGE

tuluma from Tokelau Islands 80
tulula 105, 202
tulunga 392, 529
tulutulu 65
tumatua 381
tuna 126, 128
tunga 143
tungase 147, 160, 164, 545
tunoa 13, 69
tunu 100, 104, 122, 135, 137
tunuma 639
tupa 432, 452
tupa crabs 452
tupa laufa'i 433
tupa leaf weir 477
tupe 564, 677
tupu 163
Tupu-i-vao 564
tupua rocks 329
Turbo 454
turmeric dye 110, 111, 135, 255, 301, 622, 655
turmeric, preparation of 300
Turner 207, 470, 514, 551, 552, 553, 575, 578, 613, 621, 627, 636
tungase 93
turtle 23, 522
turtle net 488
turtle shell 495, 499, 512, 515, 636
tusala 571
tusi 307
tutangi ta 621
tutu 287
tutua 287
tutunga 283, 292
tutusi 306, 307
tu'u 412
tu'u fala 75, 248
tu'u papa 75, 248
tu'unga 146
tu'u'u 447, 449, 483, 517, 529, 542
twill decoration 227
twine 231
two-ply twist rope 245
two-rod fishing 404

U

u 439, 529, 530, 566
u fanafana 530
u mata lua 530
u mata tasi 530
u mata tolu 530
u ta'afale 530
u'a 283, 549
u'a fa'apa'o'o 296
u'a o le uto 473
uai 606
Uamea 382
uatongi 591, 592, 594
ufi 133, 546
ufi fa'ataisi 133

PAGE

ufi tao ... 133
ufi valuvalu ... 137
Ui ... 132, 329
ula ... 453, 548
'ula ... 81, 628, 629
'ula fala ... 211
'ula lei ... 629
ula vai ... 453, 479
ulaone ... 333
ulatai ... 453
uli ... 126, 476, 548
uliuli ... 274
ulu ... 65, 121, 123, 124, 499, 566, 567
'ulu ... 131, 293, 372, 550
ulu lapalapa ... 112, 137
ulu maika (Hawaii) ... 565, 663
'ulu manu'a ... 233, 488
'ulu pe'epe'e ... 132
'ulu tao ... 132
ulu toa ... 566
'ulu tunu ... 132
ulu u'a ... 292
'ulu uvea ... 389
ulualafi ... 514
ulu'au ... 130
ululima ... 312
ulumoenga ... 76, 573
Ulumu ... 543
ulupanga ... 565
uluselau ... 312
ulututanga ... 287
ulutoto ... 514
uluulu ... 100, 483
uluvai ... 425
'umala ... 133, 548
umangi ... 655
umele ... 401, 504, 507
'umete ... 105, 108
'umete laitiiti ... 106
'umete tele ... 106
'umi ... 472
'umiumi ... 445
umiumia ... 517
umu ... 13, 100
umu sa ... 319
umu sa tele ... 96
umu ti ... 103, 136
una laumei ... 499
undercooking ... 122
unfinished floor (legend) ... 68
unga ... 438, 490
Ungalo ... 485
unu ... 297
unualalo ... 298
unualunga ... 298
'upenga ... 116, 469
'upenga 'afa ... 488
'upenga fa'alava ... 482, 483
'upenga lama ... 474
'upenga malie ... 486
'upenga mangingi ... 482

PAGE

'upenga matalili'i ... 483
'upenga sae'e ... 475
'upenga saosao'o ... 475
'upenga seu ... 532, 536
'upenga sumu ... 428, 477
'upenga tanifa ... 487, 488
'upenga tali ... 483
'upenga tili ... 480, 482, 483
'upenga tu uli ... 476
'upenga 'ulu ... 487
upeti ... 283, 305, 308, 311, 670
upeti fala ... 308
upeti papa ... 309
upu ... 76
'uru ... 131
usolenga ... 548
utensils ... 108
utete au lama ... 580
uto ... 424, 427, 453, 473, 555
uto malolo ... 427
utongau ... 128
utunga lua ... 643
utupoto ... 14, 87, 297
'u'u ... 213, 277, 620
'u'uti ... 479

V

va'a alei ... 519
va'a alo ... 371, 380, 508
va'a 'iole ... 524
va'a'isumu ... 524
va'a-o-taua-o-aitu tau ... 70
va'a tapa'au ... 486
va'a tele ... 407, 409
va'a tulialo ... 519
Vaatausili ... 612
vae ipu ... 552
vae'ali ... 76
vaeoa ... 408
vaepato ... 563, 557
vai ... 105
vaisalo ... 100, 104, 114, 129, 135, 136, 137, 138
vaisalo stirrer ... 115
vaisalo wringer ... 113
vaisu ... 129
vaivai ula ... 548
vala'au 'ai pua'a ... 576
valo ... 420
valu ... 104, 593
valu u'a ... 285
valusanga ... 110
valuvalu ... 544
vana ... 496
vane ... 610
vavai hiri (Cook) ... 304
vavalu ... 104, 109
vavau ... 104, 129
ve'a ... 438, 526, 532
vegetable food ... 127
Vei ... 565
vela ... 102

PAGE

velo ... 392, 543, 566, 567
vessel ... 100, 104
vete ... 445
vevela ... 102
vili ... 495
vilivili ... 553, 572
vinavina ... 495
visiting sick ... 142
Vivao ... 93

W

wall panel ... 73, 74
wall plate ... 31
wall post ... 44, 56
wall screen ... 73, 176
walled fish weir ... 444
walled trap ... 676
war adz ... 333
water ... 138
water bottle ... 118
water bottle shelf ... 72
water tip-cat ... 555, 677
water vessel ... 105
wealth ... 81
weapons ... 583, 678
weaving ... 164
weir, fish ... 429, 444
whale ivory ... 497, 629
Whakataupotiki (Maori) ... 612
wharau (Maori) ... 12
whistle ... 580
wild fowl ... 123, 527, 532
whitebait ... 439
whitebait scoop ... 441
Wilder, Gerrit P. ... 664
Wilkes ... 56, 283, 305, 404, 580
Williams ... 233, 428, 490
windmill, toy ... 552
winged net ... 483
wiper ... 307
women eating with men ... 140
women's tattooing ... 656
women's tattooing motifs ... 657
wood used in canoes ... 403
Wood-Jones ... 612
wooden bowl ... 105
wooden chest ... 207
wooden comb ... 627
wooden fan ... 634
wooden gong ... 575, 678
wooden idol ... 614
wooden trumpet ... 579
wooden temple ... 613
worked stone ... 330
Worth, Captain ... 406
wrapper ... 312
wreath ... 615
wringer ... 113

Y

yam ... 133, 544, 546

Z

zoomorph ... 611, 642

ERRATA

p. 104 line 2 from top ... *a 'asi* read a *'asi*
p. 105 line 29 from top ... neecssity read necessity
p. 133 line 15 from bottom ... *Ipomea baiatas* read *Ipomoea batatas*
p. 135 line 18 from bottom ... *Cucuma longa* read *Curcuma longa*
p. 136 line 17 from bottom ... *Aleurites molucanna* read *Aleurites moluccana*
p. 299 line 9 from top ... *Cucuma longa* read *Curcuma longa*
p. 317 line 23 from top ... noraments read ornaments
p. 418 line 5 from bottom ... coal read coral
p. 566 line 18 from top ... ward read word
p. 628 line 10 from top ... *Plumiera* read *Plumeria*